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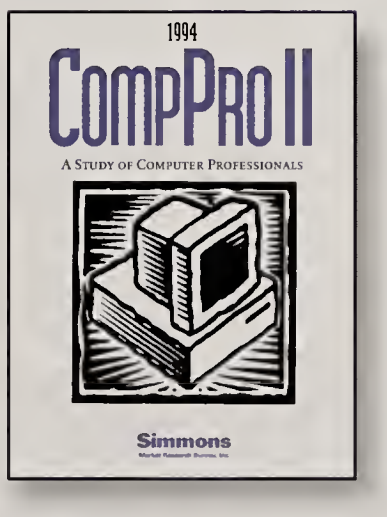

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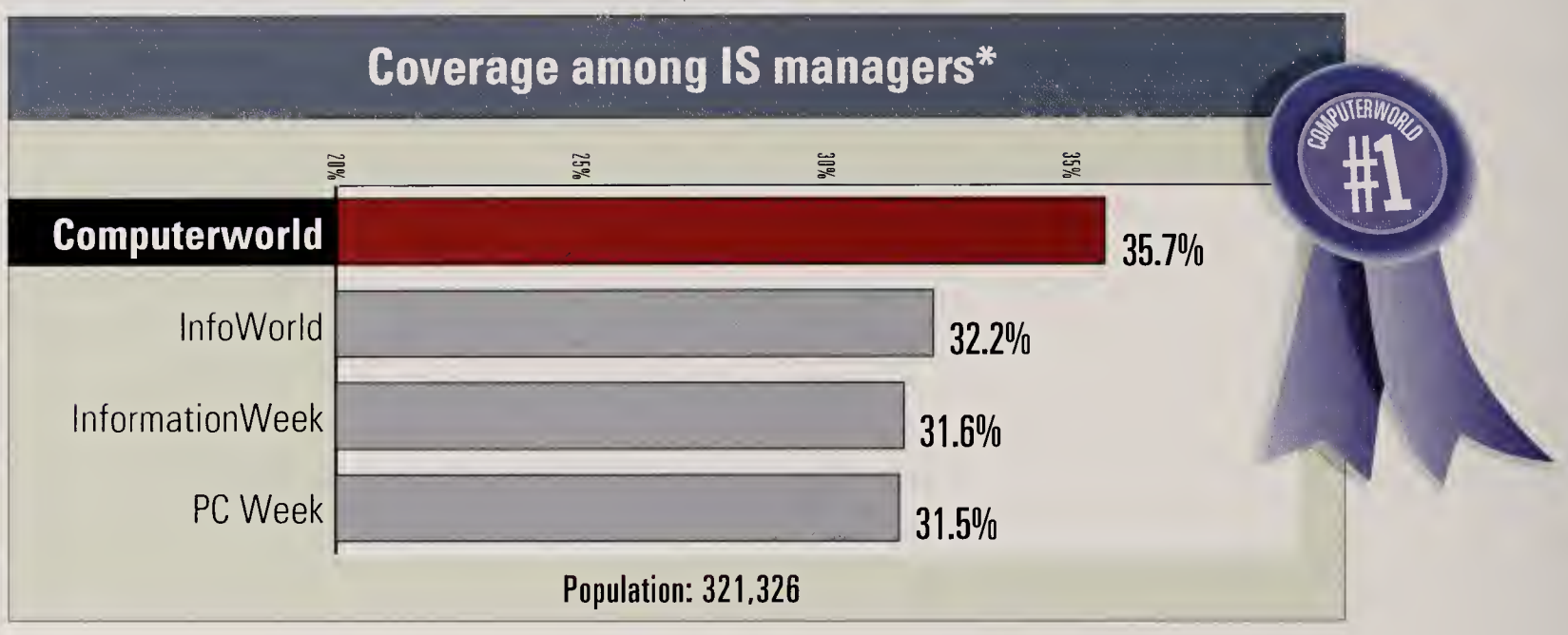

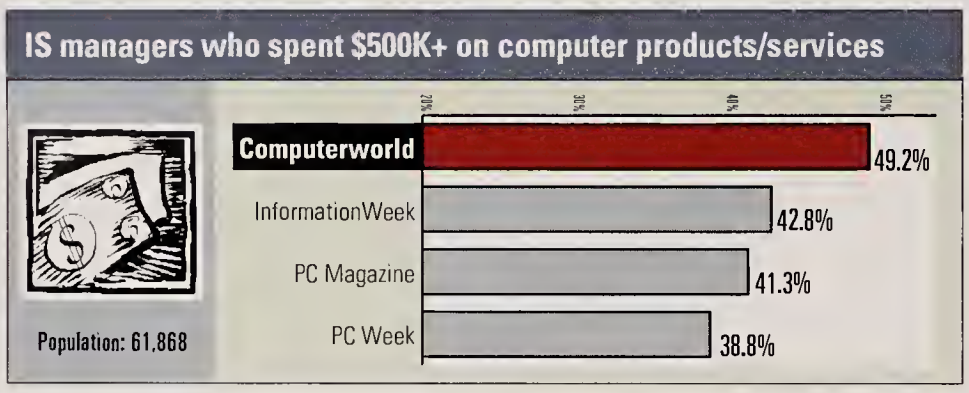

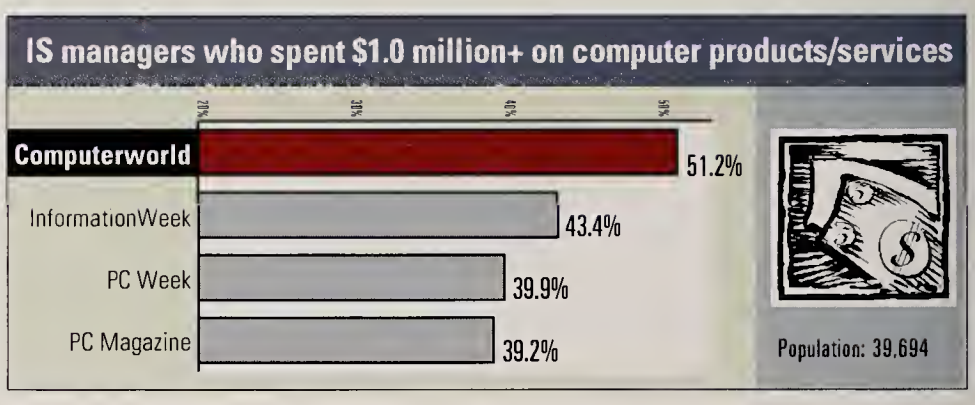

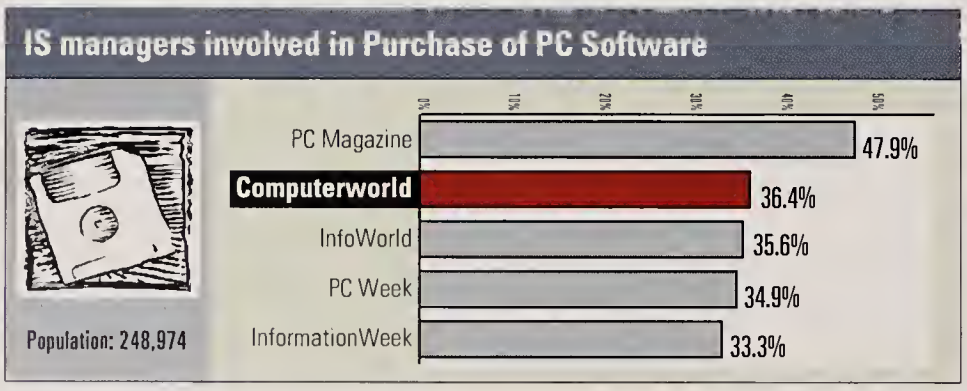

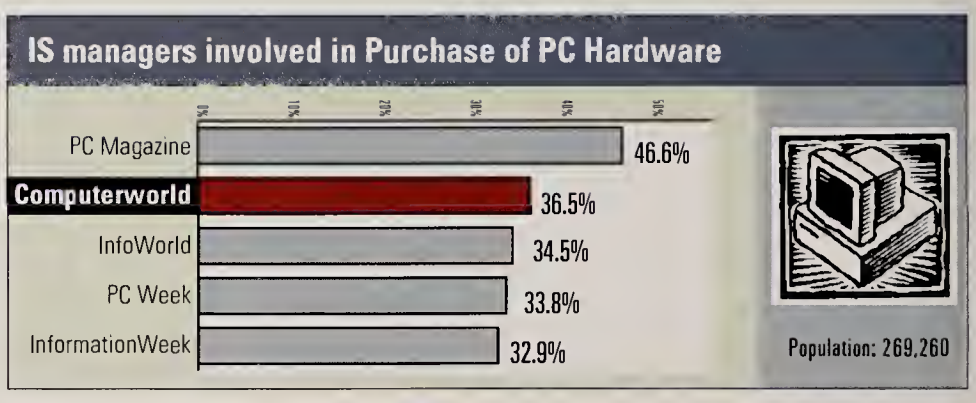

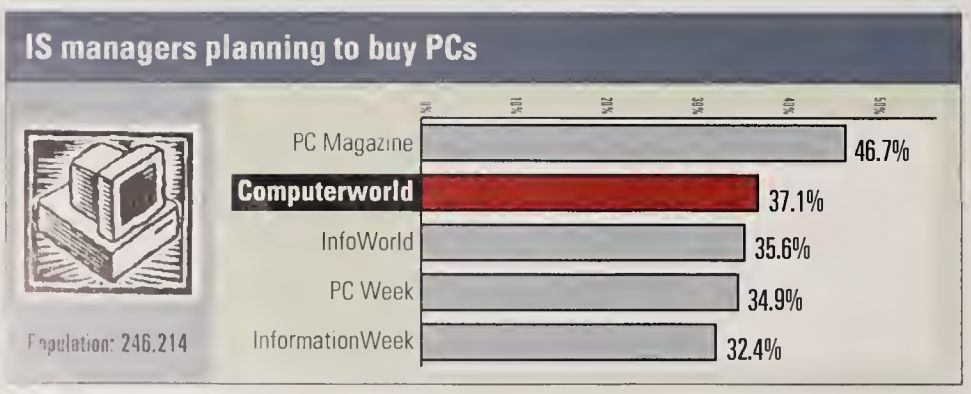

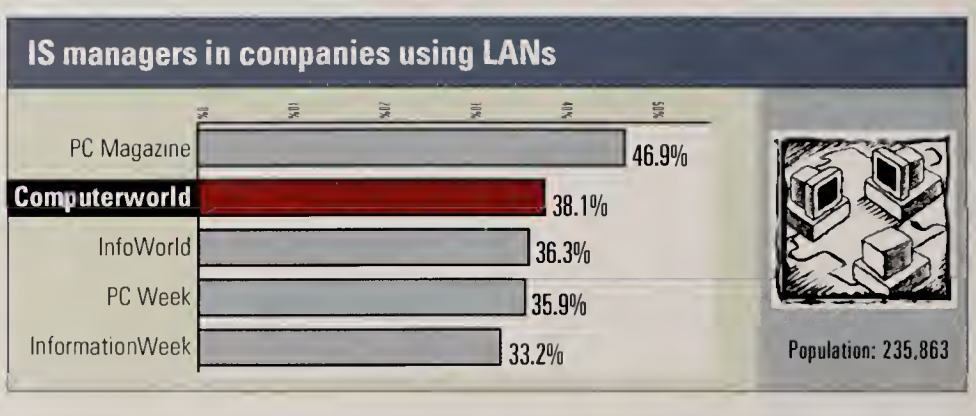

* IS managers includes: All - CIO/VP/Dir/Mgr IS/MIS, Corp/Dept MIS

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COMPUTERWORLD

NT server luring Novell users

By Elisabeth Horwitt and Ed Scannell

Enhancements and features that Microsoft Corp. is preparing for the next version of NT Advanced Server have already tilted the scales at a handful of Novell, Inc. NetWare shops, which are now migrating their network services to Microsoft's platform.

Some beta users of NT Advanced Server Version 3.5 said last week they were most impressed with a 20% to 30% increase in file and print service throughput, sophisticated TCP/IP support and superior administration features in the new NT Advanced Server release.

The release is scheduled to ship with Daytona — the next version of the Windows NT operating system — in the third quarter.

Price is right

Pricing is also a differentiating factor for NT Advanced Server: It is priced at $1,495, and Windows 3.1 installations receive an unlimited number of clients for free. In comparison, NetWare 4.01 costs between $1,395 for five users and $47,995 for 1,000 users.

NetWare 4.1 is not scheduled to ship until late this year. In a number of recent interviews, Novell customers said they are holding off on migration to Novell's enterprise network service platform until then. Microsoft hopes to take advantage of a market window, industry observers said.

Time to be picky

"It is to the point now where people making purchasing decisions are saying: If I have to pay a bunch of money to go from NetWare 3.x to something else, why not step back and look at all the options rather than blindly" pick NetWare 4.x, said Sean Stanton, a senior network engineer at Trawick & Associates, a value-add-

NT server, *page 15*

WordPerfect to reshape suite option

By William Brandel

Application suites are about to move up to the next level, as WordPerfect Corp. attempts to redefine the standard for integrated software packages.

The company is intent on defying the bundled PC application wisdom that suites are a low-cost, like-it-or-lump-it option for information systems departments. At PC Expo in two weeks, WordPerfect is slated to offer users best-of-breed application options in addition to low-cost software bundles.

In so doing, WordPerfect will give customers a range of application choices as well as integration technology that its competition will not be able to offer any time soon.

Three's the charm?

Sources close to WordPerfect said the Orem, Utah-based vendor will unveil three suite configurations at PC Expo in New York. Simultaneously, Lotus Development Corp. will roll out a new version — 3.0 — of its SmartSuite application package.

Both WordPerfect and Lotus officials said they would deliver new suites by the end of the third quarter. WordPerfect's suite will come in the following three versions:

- The basic shrink-wrapped version.
- A shrink-wrapped version that includes Borland International, Inc.'s Paradox database.
- A CD-ROM-based version that lets users choose from more than a dozen applications — from WordPerfect and other vendors — and

WordPerfect, *page 157*

Chip alliance shakes ground

By Jean S. Bozman
PALO ALTO, CALIF.

The search for a better, more flexible chip architecture for the late 1990s drove Hewlett-Packard Co. and Intel Corp. to announce a development alliance last week. The two will share the risk and the investment needed to create a follow-on product for Intel's P6, P7 and x86 line microprocessor projects.

Also part of the deal will be an Intel-compatible follow-on to HP's line of PA-RISC chips.

By joining forces on semiconductors, compilers and software

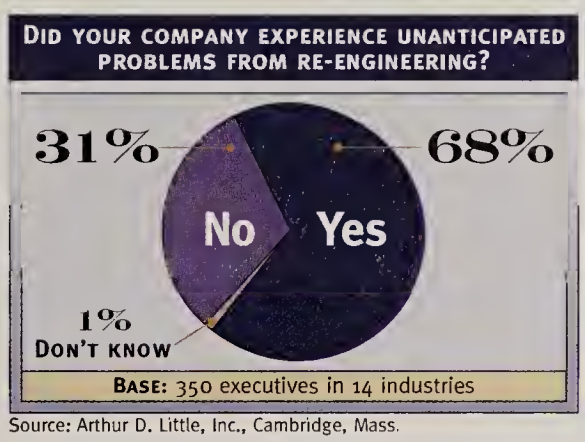
Alliance, *page 12*

Re-engineering slammed

By Julia King

Nearly 85% of top executives who have re-engineered their operations are dissatisfied with the results of their efforts. The $64,000 question is why they keep it up.

"It's embarrassing, really," said Peter Scott-Morgan, a director at Arthur D. Little, Inc. "The U.S. is hitting its highest failure rate for major change since business began, yet most companies won't acknowledge it."



Source: Arthur D. Little, Inc., Cambridge, Mass.

In two recent surveys of Fortune 1,000 companies, top information systems and business executives confirmed that so far, re-engineering has in a vast number of cases been, well, a bust.

In Arthur D. Little's 1994 study of 350 executives in 14 industries, less than one-sixth reported favorable re-engineering outcomes, Scott-Morgan said last week. Moreover, six out of every 10 executives said they encountered unanticipated problems or unintended side effects from re-engineering. These include

Re-engineering, *page 14*

IBM seeks antitrust repeal

By Mark Halper

With IBM Chairman Louis V. Gerstner banking on a future in services, a beleaguered IBM went to court last week seeking to repeal a 38-year-old antitrust accord that restricts its outsourcing activities.

IBM argues that the 1956 Consent Decree is an anachronism because IBM no longer dominates the industry as it did decades ago.

For users, a repeal of the 1956 Consent Decree could mean lower prices on outsourcing deals because IBM would be free to offer hardware and software price breaks to its outsourcing unit, Integrated Systems Solutions Corp. ISSC could then pass those discounts on to customers.

An IBM spokesman said last week that with the Consent Decree in place, "We're required to sell to [ISSC] at the same price we sell to our competitors, and that isn't to the advantage of our customers."

In U.S. District Court for the South-

IBM, *page 157*

Newspaper

High-Tech Heroes Honored

SEYMOUR CRAY, 67, chairman and founder of Cray Computer Corp., made a rare public appearance last week to accept a lifetime achievement award at the Sixth Annual *Computerworld* Smithsonian Awards in Washington. Winners as diverse as environmental agencies and computer art designers were honored for their innovative uses of information technology to benefit society.

See pages 28 and 29.

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What's Inside

June 13, 1994

BOB PROCHNOW/SABA

Student Drivers

The information superhighway isn't all fast lanes and scenic vistas. IS directors such as Marist College's Michael Corbett are finding that getting there means dodging dustballs and dealing with copyright hassles and 'netiquette' violations.

See Management page 113

NEWS

- Hewlett-Packard and Intel are planning **64-bit** compatible microprocessors that run on all major computing platforms. *Page 1*
- Amid growing reports of problems among third parties seeking to support or tie into its **Enterprise Mail Server**, a Microsoft source confirmed that delivery may slip into early 1995. *Page 4*
- Microsoft is ready to announce a version of **SQL Server** that goes up against its former partner Sybase. *Page 4*
- IBM will introduce its **RAIDs for mainframes** but is not promising much improvement in performance or price from its 3390 Model 3. *Page 6*
- Some promised functions may be missing when **Oracle** ships a major upgrade to its database management system. *Page 10*
- Grand Junction expands its network with a **"fast" Ethernet** workgroup switch. *Page 12*
- IBM is designing a version of its IBM SP/2 massively **parallel processor** with high-speed links. *Page 16*
- This week's **SunWorld '94** is seen as a showplace for Sun's enterprise client/server strategy. *Page 24*
- **Dun & Bradstreet Software** announces its client/server budgeting software. *Page 30*

COMPUTER INDUSTRY

- **Digital**'s storage unit is widely viewed as one of the company's bigger successes. *Page 36*

DESKTOP COMPUTING

- **New graphics capabilities** in the next version of Windows could hurt sales of Microsoft's Windows NT. *Page 45*

WORKGROUP COMPUTING

- Users say **WordPerfect** addressed reliability, scalability and openness issues with its new Office product, now called Symmetry, but some performance questions remain. *Page 75*

ENTERPRISE NETWORKING

- Users take a wait-and-see approach with **virtual LANs**. *Page 85*

LARGE SYSTEMS

- The **AS/400** gains some respect in the client/server and open systems worlds with its most recent releases. *Page 95*

APPLICATION DEVELOPMENT

- Little-known TakeFive Software moves into the spotlight with its **visual programming** environment. *Page 107*

MANAGEMENT

- **Robert Zawacki** says self-directed work teams and IS usually mix as well as oil and water. *Page 121*

IN DEPTH

- Humorist **Michael Cohn** offers up his version of the history of technology in his upcoming book, *Fear of Computers*. *Page 127*

CAREERS

- Look for **leadership opportunities** at companies considering electronic data interchange and E-mail integration. *Page 133*

MARKETPLACE

- If they haven't bitten yet, watch out for these **software bugs**. *Page 146*

COMMENTARY

- **Bill Laberis** says it's time to bury the 1956 IBM Consent Decree. *Page 40*
- **Ted Prinee** says the corporate world will come full circle with bottom-line-based management again giving way to vision. *Page 41*
- **Esther Dyson** finds a package designed for lawyers that can serve as a model for all types of software. *Page 41*
- **Charles Babcock** sees OpenDoc overcoming OLE's lead to help users better meet the needs of a mixed-vendor environment. *Page 6*

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Executive Briefing

Nearly 85% of top executives who have re-engineered are dissatisfied with the results of their efforts. In two recent surveys of Fortune 1,000 companies, top executives confirmed that so far, re-engineering has in a vast number of cases been a bust. Causes include mistakes such as allowing turf battles to rule and thinking of downsizing as re-engineering. Why do companies continue re-engineering efforts in the face of failure? Because it's human nature to defend what you have done, according to one expert. *Page 1*

Novell is the target of Microsoft's efforts to enhance its NT Advanced Server with more network services. Since NetWare 4.1 is not scheduled to ship until late this year, Microsoft is hoping to take advantage of a market window, industry observers said. A number of Novell customers interviewed last week said they are holding off on migration to Novell's enterprise network service platform until then. *Page 1*

The troubled effort to overhaul the nation's air-traffic control system has been drastically scaled back, with the Federal Aviation Administration recently canceling two of the five major system components and trimming a third from its Advanced Automation System project. That project, originally estimated at $2.6 billion, has soared past the $7 billion mark. *Page 32*

Ethics at issue. Amid a flurry of headlines about cyber-porn, electronic stalking, computer viruses and privacy invasions, a wide variety of interest groups — including the corporate IS community — are gathering next week to launch a National Computer Ethics & Responsibility Campaign. The goal is a consciousness-raising effort to start addressing what one industry executive calls a "computer ethics void." *Page 33*

Some of the concerns that have kept users from buying into object databases may evaporate by this time next year. Standards advocated by the Object Database Management Group are expected to work their way into product upgrades due out in the next 12 months. The industry goal is to take some of the risk out of buying object databases, which are relatively vendor-specific. *Page 107*

The 5th Wave *by* Rich Tennant

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EMS shortcomings block third parties

By Lynda Radosevich

Users who were planning to shift from host or existing LAN-based electronic mail to Microsoft Corp.'s Enterprise Messaging Server (EMS) may have to put those plans on hold. A Microsoft source confirmed last week that delivery may slip into early next year, and there are growing reports of problems among third parties seeking to support or tie into EMS.

Microsoft will demonstrate EMS — a robust messaging and groupware server — at its annual conference this week for messaging users and developers. The company will commit to first release product specifications but will not announce a ship date or pricing, Microsoft officials said.

Among the messaging issues facing both Microsoft and the independent software vendors who must fill in the groupware pieces are the following:

- Lack of Microsoft's Messaging Application Programming Interface (MAPI) support for developers who have ported 16-bit applications to 32-bit Windows emulation mode using the Win32s API. Without such support, developers cannot message-enable those applications.
- An uncertain delivery date that has slithered from mid-1994 to late 1994 and now possibly to early next year.
- Uncertain support for the X.500 directory exchange protocols in EMS 1.0., although the company said it is committed to providing that support eventually.

For George Weston Ltd., a Toronto-based food processing and retailing conglomerate, "the third-party EMS support is very important," said Pharid Jaffer, a director of information systems. One reason is that he wants to use EMS to receive live news feeds from a third-party service, Jaffer explained.

Third-party support is key to Microsoft's overall groupware and messaging strategy, called Information Exchange. Next year, that strategy will comprise updated messaging products code-named Touchdown. EMS is the server component of Touchdown. The client piece is a "universal" client that will be bundled into Windows 4.0, a 32-bit operating system known as Chicago. The other key piece is MAPI 1.0, a middle layer of software that will ship with Chicago.

By writing applications to MAPI 1.0, Microsoft is promising that third-party clients can plug into EMS services such as directory and message exchange.

Likewise, Microsoft has said all servers that support a MAPI Service Provider Interface can provide data to any MAPI client. With roughly 40 million MAPI clients expected to ship in Chicago, this promise has broad implications for Windows users and developers, users and analysts agreed.

Stumbling blocks

Still, Microsoft is throwing roadblocks in front of some developers. For instance, MAPI product manager Chris Williams confirmed that Microsoft will not extend MAPI 1.0 to support applications developed using Win32s — an API that Microsoft pushed on some developers to create 32-bit implementations of their 16-bit applications for Windows 3.1 and Windows for Workgroups.

Likewise, a previous version called "simple" MAPI does not work with Win32s applications, so those applications cannot be mail-enabled.

With Win32s, "we've gone down the pathway that Microsoft said we should to get our apps to 32-bit.... Now we're caught between a rock and a hard place," said Dan Schulz, a developer at financial applications software company Great Plains Software in Fargo, N.D.

Great Plains would like to enable users to mail reports and the like directly from its Win32s financial applications via MAPI, but it cannot. Schulz added that he has not run into the problem using a similar messaging API from Lotus Development Corp. for CC:Mail and Notes.

To get MAPI support, Great Plains and others must port their 32-bit applications to Chicago, whenever that ships. But it will be a two-step process that will add at least 10% more work on top of the Win32s work already done, said Vadim Yasinovsky, president of Clear Software, Inc.

Another potential independent software vendor, Control Data Systems, Inc., is having trouble getting the data it needs to link its X.400 and X.500 backbone systems to EMS, said Dave Folsom, general manager of electronic messaging.

Microsoft has said EMS will have an X.500 directory, and Control Data has 150 large government organizations and corporate customers that are considering using EMS in departments and linking into Control Data's backbone system.

Yet "Microsoft has been reluctant to give us the information that we need for directory exchanges," Folsom said.

Despite these difficulties, MAPI's enormous potential is expected to draw up to 60 independent software vendor support announcements at Microsoft's messaging conference next week in Seattle. Among those making announcements will be JetForm Corp., which will announce MAPI 1.0 support that lets JetForms forms hook into any other forms product that supports MAPI.

Senior editor Ed Scannell contributed to this report.

Database servers

Microsoft SQL Server seeks to best Sybase database

By Stuart J. Johnston and Kim S. Nash

Microsoft Corp. will unveil this week a version of SQL Server that targets the database's creator, Sybase, Inc., by adding support for more than four processors as well as database replication services.

The upgrade to SQL Server for Windows NT Advanced Server, code-named SQL95, will also solve Microsoft's own nagging shortcomings, users said. Specifically, SQL95 is intended to address problems in scaling up past four or six processors on a symmetrical multiprocessing (SMP) server.

"Performance [on the current version] falls off after about four processors, and they're definitely telling me that SQL95 re-engineers the SQL kernel to take better advantage of SMP," said one major SQL Server reseller, who asked not to be identified.

Such improved scalability should outdo Sybase's multiprocessor support, said Rich Finkelstein, an analyst at Performance Computing in Chicago. "Microsoft gutted the task-scheduling mechanism in Sybase SQL Server to let NT do all the SMP processing and scheduling," he said. That way, NT can schedule many tasks at once, whereas Sybase's database-centric approach limits scheduling to a single processor at a time, he said.

Replication competition

Meanwhile, SQL95 will nip at the heels of Sybase's System 10 edition of SQL Server in other ways. Sybase has pointed to its year-old Replication Server as a differentiator of its database. Now Microsoft will also offer replication features to let users duplicate and synchronize databases across many sites.

"Replication makes more options possible for decision support and database backup," said Sherm Weinberg, president of the Great Lakes SQL Server Users Group. "A lot of us are very excited," he said, adding that Microsoft briefed the user group on SQL95 last month.

SQL95, which is slated for a late summer beta test, also adds improved systems management features, code-named StarFighter. The upgrade will include a common Visual Basic Applications Edition macro language and a task scheduler called SQL Monitor. The goal is to help developers integrate SQL Server applications with Microsoft's Office. And SQL95 will come with "administration wizards" that can perform maintenance tasks at programmed intervals and an interface to Object Linking and Embedding (OLE) 2.0, called SQLOLE.

Dueling databases

Microsoft promises several additions to its SQL Server, some of which Sybase already supports

	Microsoft	Sybase
Replication	Built into database	Requires add-on module
E-mail integration	Via Messaging Application Programming Interface	None
Systems management features	Some	Extensive, via add-ons
Direct interface to object tools	Yes, to OLE 2.0	None
Gateways to nonrelational data sources	None	Several
Availability	January 1995	Now

Sybase offers its own systems management capabilities, but the two firms approach the problem differently. Sybase builds or buys add-on tools to manage its SQL Server product, while Microsoft plans to embed as many functions as it can into the NT operating system.

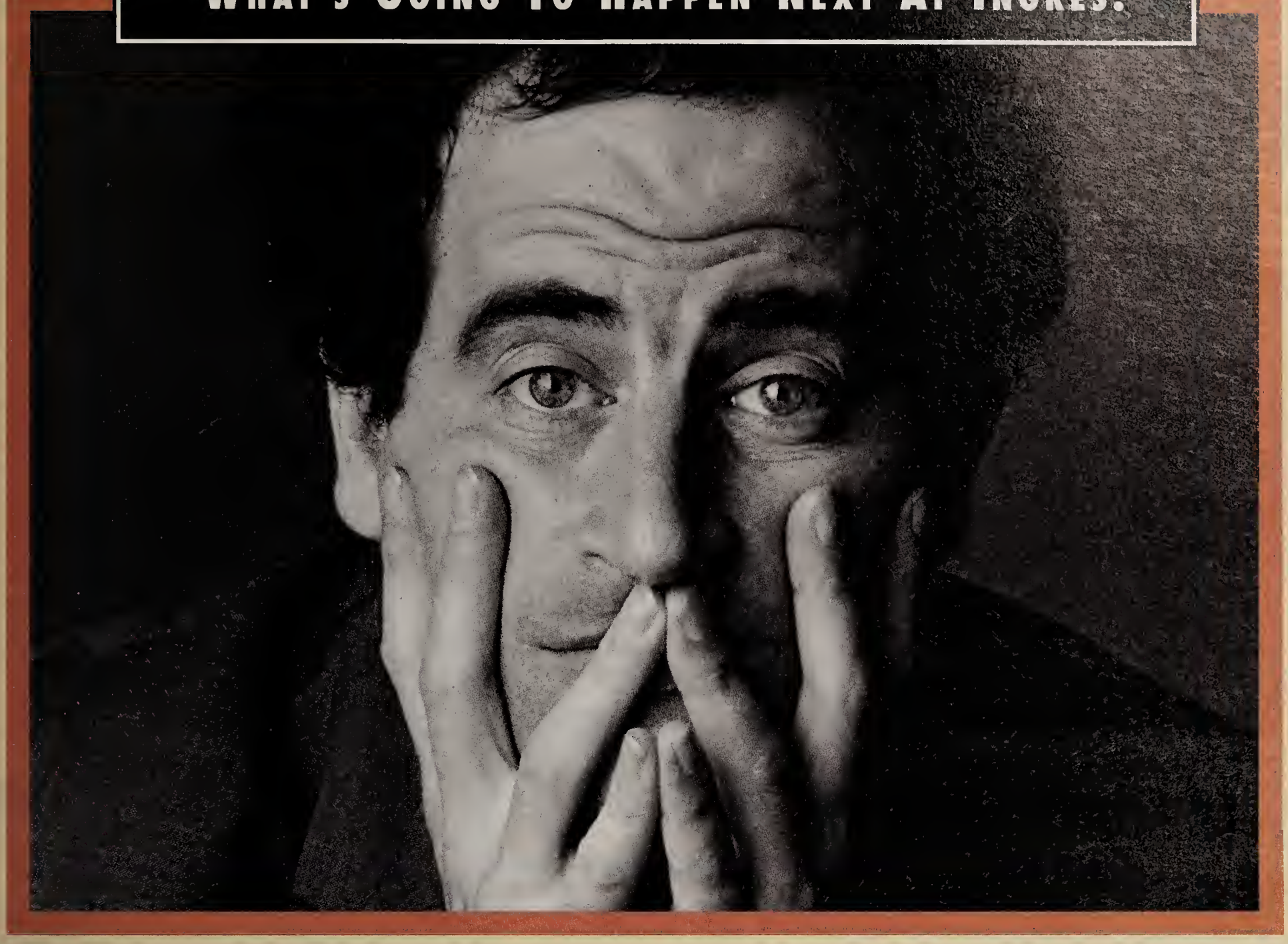
Moreover, Microsoft's SQL95 promises, coupled with relatively low prices, will make Microsoft's SQL Server hard to beat for workgroup-caliber applications, Finkelstein said. "It's hard to justify the exorbitant costs of an Oracle or Sybase when Microsoft is adequate and substantially cheaper."

SQL95 will likely ship during the first quarter of next year, said sources briefed by Microsoft. Some company insiders said they hope to get it out by year's end.

Microsoft confirmed that a demonstration is scheduled for tomorrow but declined to give details.

Harley Arnett, chief information officer at Foster Ousley, Conley, a mortgage and loan appraisal firm in Walnut Creek, Calif., hailed the upcoming announcement. The company runs more than 300,000 transactions per day and wants to balance loads better and do faster bulk copying, Arnett said. "Microsoft tells us we'll get those abilities by the end of the year. I hope that's what happens."

Good News For Those Of You Wondering What's Going To Happen Next At Ingres.



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ORACLE

OpenDoc extends OLE's reach

Microsoft's Object Linking and Embedding (OLE) has swept PC software development as an idea whose time has come.

There is a worthy follow-up idea, OpenDoc, which will extend the activation of objects beyond OLE-compliant applications to Unix and OS/2, while adding features that make it easier to share distributed objects. Microsoft is also working toward a shared environment, but OpenDoc's design has the virtue of an inherently more distributed approach.

OpenDoc spokesmen, under the umbrella of Component Integration Laboratories, acknowledge that they face two disadvantages in their race with OLE:

- They appear to be following Microsoft's innovations when they need to be in a leadership position.
- As OpenDoc becomes real, pieces of it will be delivered by different parties — Apple, IBM and WordPerfect/Novell — with the possibility of several messages. Instilling the belief that their individual contributions have been developed according to one plan, work together and will remain synchronized will be a huge challenge.

So far, I have seen little evidence that CI Labs has a knack for convincing the market it is about to deliver what it has intelligently conceived.

Nevertheless, CI Labs is capable of delivering on its promises. Good technology in this instance should not end up in the back of the bus just because it is already in the numerical minority.

First let's take a look at what OLE has brought to the party.

The Meta View

The OpenDoc challenge is to generate the correct editor for the user of the file being manipulated.

Charles Babcock

In its simplest manifestation, a user can double click on a file that was created in another application but embedded in the application with which the user is currently working. An editor is superimposed on the window to allow the file to be revised. Instead of just linking a file in one application to another, we may now work on it outside its native application but in its native format — with the style of editor that helped create it.

OpenDoc takes that innovation another step, opening editors as if they were nested inside each other, editors that natively function on different platforms and under different operating systems. This sounds like an obvious step but accomplishing it is far from simple.

The various editors a user may have running could be written in different languages. As a user works on a compound document, the correct editor must respond to mouse events or keystrokes. As the user works in more than one window, the active editor must avoid painting bits over work in another window.

The OpenDoc challenge is to generate the correct editor for the user of the file being manipulated, regardless of platform of origin (Macintosh, DOS or Windows PC or Unix workstation), and sort out the boundaries between editors as work proceeds.

I have been talking in terms of editors, but in fact there are several other cross-platform tasks that need to be managed. OpenDoc will have an Open Scripting Architecture that allows different scripting languages to manage multiple applications. OpenDoc's Bento stores objects in a library with one persistent identifier, even though they may be made up of many dissimilar data types. SOM, OpenDoc's System Object Model, is an object-linking mechanism supporting multiple languages.

Dealing with compound documents in a mixed vendor environment is a complex task, but the demands of a mixed environment are what confront most IS managers today. If they want their Macintoshes, PCs and Unix stations to work together, they are going to need the services of OpenDoc. And as Jed Harris, director of CI Labs, Mark Ericson at WordPerfect, Cliff Reeves at IBM and Howard Rosenfield at Apple demonstrated recently at Comdex/Spring '94, OpenDoc can meet the challenge.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Mainframe storage

New IBM arrays fall short of rival EMC's performance

By Craig Stedman

IBM will finally introduce a long-awaited pair of redundant disk arrays for mainframes next week, but it is not promising much improvement in either price or performance compared with its 3390 Model 3 device.

That message is turning off some users and analysts because it means the computer giant will not bridge the performance gap between itself and rival EMC Corp., which has been using its throughput advantage to take customers away from IBM.

Alamo Rent A Car's Thomas Loane: *'IBM's announcement looks like a real snoozer'*

"In terms of a leapfrog over EMC, I don't see it as anything like that. And all things being equal, I'd rather get the faster one," said Gary Davis, director of information technology at Bergen Brunswig Corp., a pharmaceutical distributor in Orange, Calif., that uses EMC's Symmetrix arrays.

The redundant arrays of inexpensive disks (RAID) Level 5 capabilities included in IBM's products to protect data in case of drive failures are "nice, but not the most attractive thing for us," Davis added. Speed is more important, and "there's just not a lot there" in IBM's arrays, he said.

Trying to halt the flow

IBM is depending on the new arrays to stop the bleeding in its mainframe direct-access storage device (DASD) market share, which is expected to drop from 60% in 1993 to 49% this year, according to estimates from International Data Corp. (IDC) in Framingham, Mass.

Small, but powerful

Both of IBM's arrays will support up to 96G bytes of working data and 32G bytes of backup space. They use 3½-in. disk drives and take up less than half the space of the 3390 Model 3, which is comparable to the size of EMC's arrays, said Bill Nelson of IBM.

But the lack of a significant gain in performance over the 3-year-old 3390 Model 3 could make it harder for IBM to persuade users to turn their backs on EMC's faster Symmetrix 5500-3 arrays, said David Vellante, a senior vice president at IDC.

"EMC has clearly won in the performance game, and that's what sells," Vellante noted. "IBM is still not being aggressive enough. Their technology is absolutely superb, but I see them sitting on it."

IBM's announcement "looks like a real snoozer," said Thomas Loane, vice president of computers and communications services at Alamo Rent A Car, Inc. in Fort Lauderdale, Fla.

"What they're offering doesn't seem to have any particular advantages yet," Loane added. "The only things they're offering is RAID and a little bit smaller [footprint], but I'm not going to have a buying frenzy over that."

The IBM arrays, referred to by analysts as the 9390 and 9590, are scheduled for volume shipments in October. IBM will join Storage Technology Corp. as the only mainframe DASD vendors marketing RAID 5 or higher devices, although Hitachi Data Systems Corp. and Amdahl Corp. have also promised such products.

Bill Nelson, director of marketing at IBM's Storage Systems Division, said IBM expects more than 75% of mainframe DASD sales to involve RAID 5 arrays within a year. He noted that IBM managed to avoid a performance loss in going to RAID 5, which typically imposes a penalty in writing data to disks.

Paul Maszczak, corporate director of data processing operations at C. R. Bard, Inc., a maker of medical equipment in Murray Hill, N.J., said the RAID capabilities will get him interested in the IBM arrays because the improved data reliability should reduce the need for tape backups.

"It at least allows us to move the backups to a point in time when it minimizes the impact on the users," Maszczak said. IBM should be "cost-competitive and perform very well" even at the 3390 Model 3 levels, but C. R. Bard will likely wait until mid-1995 to buy the RAID 5 technology, he added.

The price you pay

IBM's RAID Level 5 subsystems are expected to sell for less per megabyte than Storage Technology's higher capacity Iceberg

PRODUCT	PRICE per megabyte
Iceberg	$5 to $5.50
IBM 9590 (with 3990 controller)	$4.25 to $4.50
IBM 9390 (direct attach to mainframe)	$4
EMC Symmetrix 5500-3*	$4

*Symmetrix supports RAID Level 1 disk-mirroring only

Source: International Data Corp., Framingham, Mass.

The 9590, which attaches to IBM's 3990 disk controller, will have the same price and performance as the 3390 Model 3, Nelson said. The 9390 connects directly to the mainframe and may run up to 25% faster in applications with small cache sizes, but it also would be "mostly a push" as cache sizes increase, he added. Its pricing will be "a little lower" than the 9590.

The 9390 originally was expected to be a higher-performance array supporting only RAID Level 1 disk mirroring, the same as EMC's Symmetrix [CW, Nov. 22, 1993]. But it was changed to a RAID 5 design earlier this year to improve reliability, Nelson said.

He added that IBM may start offering the arrays in non-RAID form during 1995 to boost performance.

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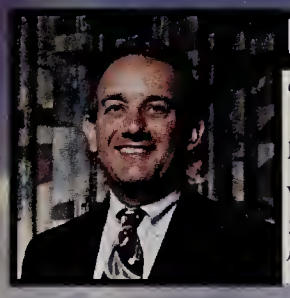

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Shortages continue to plague Compaq

By Jaikumar Vijayan

Less than a week after Compaq Computer Corp. announced a series of dramatic price cuts, reports of some serious availability problems have once again raised questions about the leading PC maker's ability to consistently meet the tremendous demand it seems to have generated in the past few quarters.

Last week, major distributors and resellers confirmed that Compaq had informed them it would scale back planned shipments to the channel by as much as 20% to 25%. Compaq refused to comment on its reasons, but observers cited component and chip shortages, among other factors.

Compaq products that are most constrained are the DeskPro XE and XL lines, the new ProLinea desktops and LTE Elite notebooks, according to resellers and distributors.

The shortfall comes as Compaq outstrips archrival IBM PC Co. in unit sales and underscores a problem for many PC players, analysts said.

"The long-term impact of this sort of thing is that users start to view new product announcements a little more skeptically," said Joyce Gavenda, a research analyst at Summit Strategies in Boston. "This sort of thing used to happen more commonly in the software industry," she said, predicting that availability issues with major vendors could slow market momentum.

A key problem, observers said, is the inability on the part of most vendors to predict demand.

Growing market demand, coupled with decreasing product life cycles that obsolete systems in less than six months, are bedeviling vendors trying to accurately forecast market demand while maintaining a competitive inventory, according to Phillippe DeMarcilliac, a researcher at Dataquest, Inc. in San Jose, Calif.

So far, the battle has been less than successful, analysts said. One case in point is IBM's recent flooding of the channel with ValuePoint systems. It reportedly forced the company to take substantial and expensive price cuts.

"Most of [Compaq's current availability problems] are a direct result of its inability to forecast demand," said Ahmed Manshouri, senior vice president of procurement at Vanstar Corp. "They still haven't been able to come to terms with it," he said.

No problem

For users, news of the continuing availability problems will make little immediate difference.

Feroze Bilgrami, a technical consultant at Baxter Healthcare Corp. in Chicago, said his firm had not yet felt the full impact of Compaq's shortages.

Glen Sandusky, vice president and chief information officer at Aon Speciality Group in Chicago, has waited nearly three months for delivery of several DeskPro models he ordered in March. Still, while he acknowledges having had similar delivery problems with Compaq in the past, he said pricing and delayed availability alone would not cause him to shift vendors. Other important considerations include support and technology.

Some analysts, however, predict that not all users will be that charitable toward Compaq or any other major vendor if delays persist.

"If users are made to wait long enough, they are going to go elsewhere," said Ron Hulak, a senior industry analyst at BIS Strategic Decisions in Norwell, Mass. "There is not a lot of reason for brand loyalty these days," he said, citing both narrowing price deltas and limited product differentiators.

Ironically, the recent spate of price cuts — and the promise of more to follow — from Compaq, IBM, Dell Computer Corp., Gateway 2000, Inc. and others could be one way to put the brakes on immediate demand, according to some analysts.

"Promising ever-decreasing prices is one way of making potential buyers delay their purchase decisions," Gavenda said.

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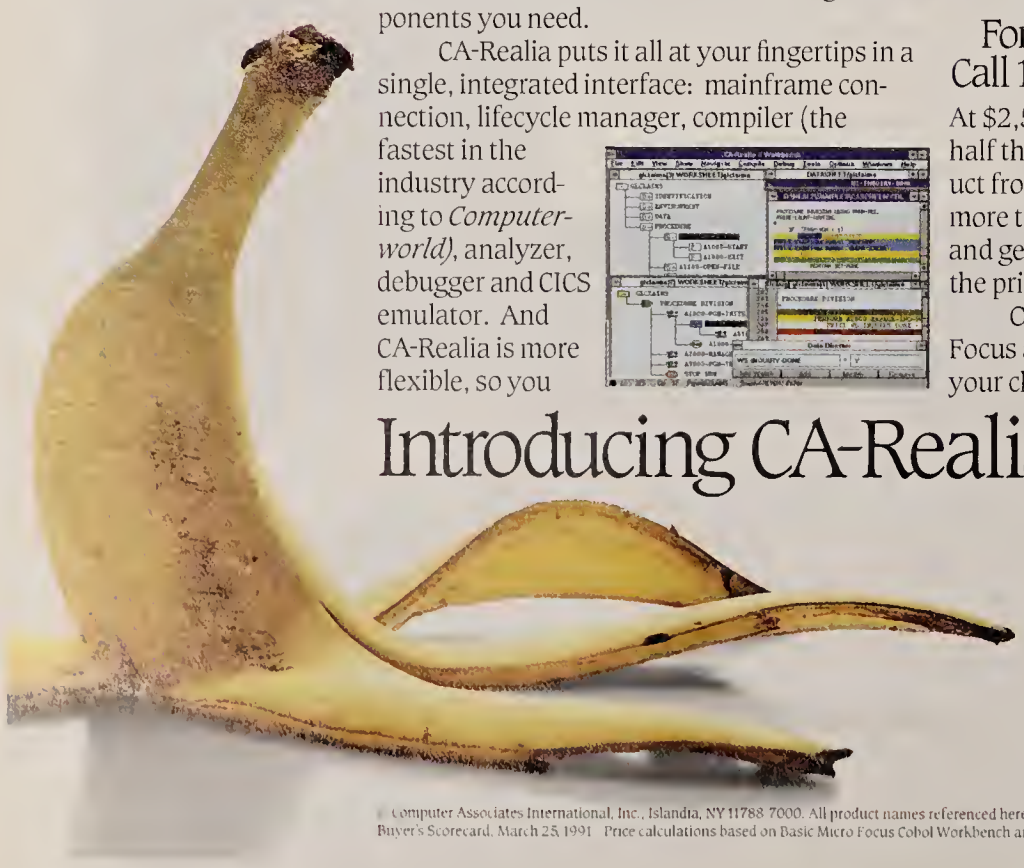

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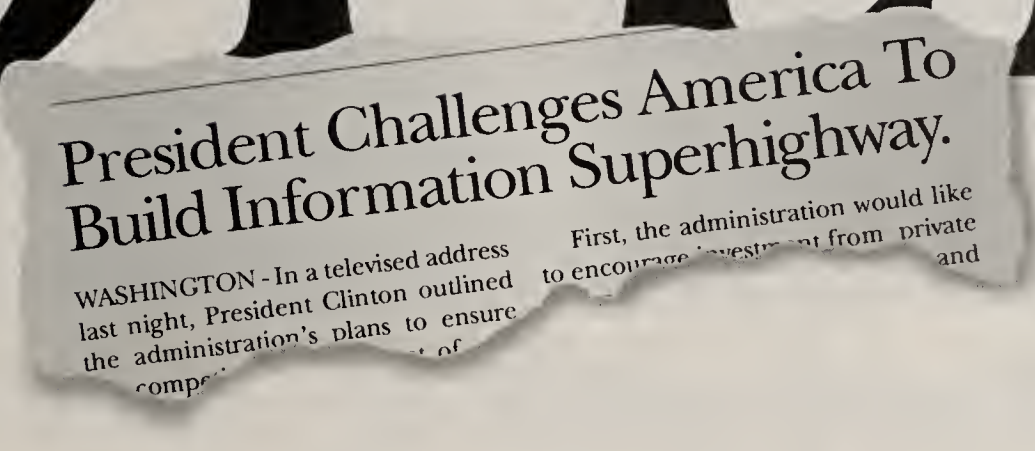

President Challenges America To Build Information Superhighway.

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News Shorts

Judge rules against Microsoft

Mierosoft Corp. must recall all unsold eopies of DOS 6.0 and 6.2 worldwide, instead of just in the U.S., a federal district court judge in Los Angeles ruled late last week. The permanent injunction is the latest blow to Microsoft in the patent infringement case filed in January 1993 by Stae Eleetronies in Carlsbad, Calif. Microsoft officials said they will appeal the ruling. In the meantime, the company said it will ship a new version called MS-DOS 6.22, which features internally developed disk compression that is about 5% slower than DoubleSpace.

Oracle upgrades manufacturing apps

Oraele Corp. will ship upgraded manufaeturing applications this week as part of its Release 10 software set announced in April, a spokeswoman said. New features include support for 20 foreign languages and modules such as supply chain and cost management. A full set of manufacturing, finaneial and distribution applications starts at $275,000, Oraele said.

NetWare Ready makes its debut

Novell, Ine. last week announced the NetWare Ready program, an expansion of its Yes program for eertifying that a given product runs with NetWare. The NetWare Ready program will provide eertifieation for the growing number of OEM hardware vendors that ship PC hardware bundled with NetWare, Novell DOS, Personal NetWare or Novell Universal Client, Novell said. Among the vendors announcing NetWare-ready products last week were Cabletron Systems, Ine. and SynOpties Communieations, Ine.

Novadigm readies management tool

Novadigm, Ine. in Mahwah, N.J., has annouueed that its Enterprise Desktop Manager (EDM), an objeet-oriented systems management platform that deploys and synehronizes distributed elient/server applieations, will be ported to Hewlett-Paekard Co.'s HP/UX environment by year's end. The HP/UX version of EDM will allow HP 9000 users to configure and manage applications on HP/UX, Windows, DOS, OS/2 and AIX workstations. EDM costs $100 per client and $20,000 for the enterprise server.

Cisco rolls out PC tools on CD-ROM

Ciseo Systems, Ine. in San Jose, Calif., last week introduced a suite of PC software tools on three CD-ROMs designed to allow small businesses with little networking experience to design, install and configure their own router-based internetworks using a single Windows-based PC. Called Point and Click Internetworking, the CD-ROMs consist of an internetworking overview, installation tool kit and Cisco router documentation library. The CDs will be available in August for $995.

HP unveils enhanced storage OmniBook

Hewlett-Packard Co. today is scheduled to unveil an enhanced storage version of its OmniBook notebook. The 33-MHz 486SX-based OmniBook 530 will feature an optional 3½-in. floppy disk drive, which HP has not been offering on its existing 25-MHz 486SLC model. The new machine stays at 2.9 pounds but is pricier than its predeeessor, which lists at $1,399 for 105M bytes of storage. With the optional floppy, Model 530 lists at $1,998.

SHORT TAKE Silicon Graphics, Ine. and Nippon Telegraph and Telephone Corp., the Japanese telecommunications giant, last week struck a deal to jointly develop an interactive multimedia service in Japan.

More news shorts, *page 16*

Oracle 7.1 hits the streets, but some features still in garage

By Kim S. Nash

Some long-awaited parallel processing and replication features are due out next week from Oraele Corp. in the form of an upgrade to the firm's namesake database, aecording to sources briefed by Oracle.

The eompany plans to unveil Oraele 7.1 on Wednesday, making it available to eustomers immediately, the sourees said. However, not all the replieation capabilities and multiprocessor support that Oraele has promised will ship at that time. Some features will not appear until the first quarter of 1995.

Oracle offieials eould not be reached for eomment.

To some extent, Oraele is playing leapfrog with its database rivals, aeeording to Bobby Cameron, an analyst at Forrester Research, Ine. in Cambridge, Mass. Oracle has lagged behind both The ASK Group, Inc. and Sybase, Inc. in releasing advanced replication functions, which let users copy and synchronize databases across remote sites at set intervals, Cameron said. ASK shipped Ingres/Replicator in Deeember 1993, while Sybase delivered its Replieation Server add-on module a year ago.

But Oraele will one-up the others with more sophistieated replieation technology in Oracle 7.1, Cameron said. For example, the upgrade is expected to inelude automatic conflict resolution when users try to update the same data. Sybase's Replication Server laeks that feature.

Replication technology in Oracle 7.1 offers an automatic conflict resolution feature that kicks in when users try to update the same data.

Shipment of Oracle 7.1 features will oeeur in stages, the sourees said. The produet is due to ship next week with transparent two-phase eommit and improved performanee on NCube and Meiko Seientifie massively parallel eomputers.

On the schedule

Meanwhile, first-quarter 1995 additions include the following:

- Event-driven replication.
- Multisite database update.
- Mature symmetrical multiprocessing (SMP) functions, such as confliet detection and resolution.

More important than the tit-for-tat among database makers, however, is how eurrent users might put new features to work in client/server schemes, noted Mark Farnham, president of the Oracle Applieations User Group.

Oraele 7.1's Parallel Query Option will help Farnham, a database arehiteet at Burlington Coat Factory Warehouse Corp., make better use of the 94 proeessors the Lebanon, N.H., clothing firm runs among six Sequent Computer Systems, Inc. maehines, he said.

Data loading and shifting "that used to take days now takes hours," he said. Farnham has been testing Oracle 7.1 for a few months and plans to migrate applications to it in the next year.

Oracle is racing against Informix Software, Inc. to release full-scale multiproeessing functions. For example, parallel query, the ability to split eomplex end-user database requests among several CPUs, is key to making SMP and massively parallel computing realistie for users. Both firms have promised that, but neither is slated to deliver it before 1995.

D&B Software plans port to Oracle

By Roscmary Cafasso

Although it remains officially uncommitted to database support beyond Sybase, Inc., Dun & Bradstreet Software is planning an Oracle Corp. port for its elient/server applieations, industry observers said last week.

D&B is "obviously seriously eonsidering this and probably figuring out how to bring it to the market and when," said Jennifer Scholze, a senior analyst at International Data Corp. in Framingham, Mass., of the software company's strategy for the Oraele platform. "It is unlikely that they would not do this."

The move would end a long-standing eriticism of D&B Software's elient/server strategy, which has been wedded to the Sybase database management system sinee its inception and which observers consider too limiting. In contrast, D&B Software's competitors eontinue to strengthen and expand their multidatabase support.

Doubling up

D&B Software rival SAP America teamed up with Software AG of North America last week for U.S. business, but the two companies have already teamed up in Europe. Software AG said it has won 50 new customers there based on the R/3-Adabas offering.

Rival moves

Just last week, for example, SAP America, Ine. announced plans to support Software AG of North Ameriea, Ine.'s server version of Adabas, whieh would bring the number of databases it supports to four. The others inelnde databases from Oraele, Sybase and Informix Software, Ine.

A D&B Software spokeswoman refused to eomment last week on an Oraele port for its SmartStream set of elient/server applieations other than to say, "We are evaluating other databases, ineluding Oraele."

However, one new D&B Software eustomer, whose eompany is an Oraele shop, said he had an agreement with D&B Software to port its SmartStream software to Oracle.

Bob Marthinsen, program manager in the information teehnology organization at Aleatel Network Systems, Ine., said his company recently purchased SmartStream Budget, which D&B Software annouueed last week (see story page 30). "We will initially bring it up on Sybase, but our agreement states that we can port that to Oracle," Marthinsen said.

"We have plans to move to FinaneialStream, but we won't do that until we ean migrate it to Oracle," Marthinsen added. He said the company is working with D&B Software on this issue.

D&B Software would not eomment on this speeifie deal.

Observers said D&B Oracle support may eome down to an issue of timing. Tim Harmon, a program manager at Meta Group, Inc. in Westport, Conn., said he suspects D&B Software may be gun-shy. "I think D&B gets beat up for annouueing things and taking so long to ship them," Harmon said, referring to the initial SmartStream launch. "Until they get a better grip on this, they may be holding off."

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MICRO FOCUS®

NexGen seals Pentium pact

Signs manufacturing deal with IBM for clone

By Jaikumar Vijayan

Three months after it announced a clone of Intel Corp.'s Pentium chip, NexGen has formalized an agreement with IBM Microelectronics to manufacture its Nx586 Pentium look-alike processor.

As a result of the agreement, Pentium-class systems based on the NexGen processor should become available by year's end — initially from low-cost systems vendors overseas, analysts predicted.

For NexGen in Milpitas, Calif., which has been searching for a manufacturing facility since it announced plans in March to build a Pentium-class processor, the IBM pact represents a critical and major first step, analysts said.

"Getting IBM to manufacture their chips for them was very crucial," said Dean McCarron, an analyst at Mercury Research in Scottsdale, Ariz. "The fact that [NexGen] now has access to such a high-class manufacturing facility goes a long way toward establishing its credibility."

The NexGen Nx586 processor will start shipping in 60- and 66-MHz versions, and a 100-MHz version is expected by year's end.

Capable of competing

For IBM, the deal marks the third in a series of similar pacts. It is processing a joint chip manufacturing agreement with Cirrus Logic, Inc. in Fremont, Calif., and already has an Intel Corp. clone manufacturing agreement with Cyrix Corp.

"It's inconvenient for Intel. Without IBM, NexGen and Cyrix would have been in trouble finding manufacturing capacities. [IBM's Technology has] given them the capacity to compete with Intel head-on," said Linely Gwennap, editor in chief of "The Microprocessor Report" in Sebastopol, Calif.

Under the agreement, IBM will manufacture and supply NexGen with fully tested and packaged processors. The Nx586 is expected to start shipping in full volume by year's end. Though there are no plans for IBM to sell NexGen processors in the merchant market, neither company ruled that out.

Analysts discounted the idea of IBM selling NexGen processors in the near term, though they, too, did not rule out the possibility. "NexGen basically allows them to put their [fabrication] capacities to use. It also gives them a backup if Cyrix has problems with its M-1 chips," Gwennap said.

Meanwhile, IBM is well along in negotiating a manufacturing agreement with Cirrus Logic.

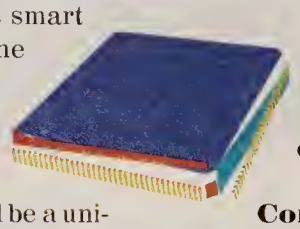
According to an IBM spokesman, the agreement will provide for the two companies to jointly operate IBM's chip manufacturing plant in East Fishkill, N.Y.

IBM declined to give more details, but the joint venture is expected to produce a range of application-specific integrated circuits for PCs and servers. IBM said it will make an announcement soon.

Alliance

CONTINUED FROM PAGE 1

development tools, HP and Intel will make sure software vendors can build and deploy 64-bit applications on next-generation machines before any are actually made, said John Logan, vice president of Aberdeen Group, a consultancy in Boston. "Intel is smart enough to know when it's time to be at the end of the x86 line."



Some users said last week that they anticipate smoother sailing in enterprise computing as applications are ported to a few standard chips. "There will be a universal platform for everything from a workstation to a PC," said Dennis Walsh, chief information officer at Entergy Corp.

Entergy, a $6.2 billion utility in New Orleans, has Unix servers and about 10,000 PCs. "It'll end up like mainframes: Some chips will do processing for CISC-type applications, others for accelerating [graphics] activity, others for voice processing," Walsh said.

Analysts compared the HP/Intel venture to the joint effort of IBM, Apple Computer, Inc. and Motorola, Inc., which created the 32-bit PowerPC chips that began shipping last year. "I would imagine that IBM is not terribly thrilled with it," said Andrew Allison, a Carmel, Calif., RISC consultant who edits the "Inside the Computer Industry" newsletter. "It's probably the only combination that is virtually guaranteed to have the horsepower to stand up to PowerPC."

The HP/Intel effort will pick up on HP's plans to deliver a "post-RISC" architecture [CW, Dec. 6, 1993].

The resulting 64-bit chip, due for shipment after 1998, would run multiple operating systems and could be used on high-performance workstations, PCs and data-center-style enterprise servers. Intel will fabricate the chip, but HP did not make clear last week whether it would manufacture this follow-on to its PA-RISC 32-bit processor. House said it would impact Intel's P7 chip, which is already in development.

The joint effort, which analysts estimated will cost at least $500 million over five years, will produce specialized chips that will run all Unix and Microsoft Corp. operating systems. The venture is so big — it includes $8.7 billion from Intel and $20.3 billion from HP — that the two firms expect it will be reviewed under the Hart-Scott-Rodino Act, a federal antitrust law.

Rich Sevcik, general manager of HP's Systems and Server Group, said he expects the pact will produce a common architecture for Intel to sell and for HP to use in its machines. Neither firm gave many details. "When we get further out in time, we'll have to decide what kind of labels to put on these products," he said.

Compatibility the main issue

Some HP users said their chief concern would be compatibility with the existing line. "If they come out with something that is not compatible with the installed base, they're going to be in trouble," said Bill Gates, director of technology planning at Longs Drug Stores, Inc. in Walnut Creek, Calif.

Sam Ellis, associate vice president of information services at Portland Community College in Portland, Ore., said the deal was an eye-opener. "It sure beats the pants off 'We've got a faster PC,'" he said.

The future family of Intel chips, which will supersede both the Intel x86 and PA-RISC lines, will probably be optimized for various computing tasks, analysts said. It may have characteristics of both CISC and RISC processing.

Whatever the final characteristics of the processors, the potential for reduced support and maintenance costs ranks high on users' wish lists. "The concept of having a single chip architecture eliminates one of the disconnects in the support and maintenance process," said Gene Friedman, vice president of applied technology at Chase Manhattan Bank NA in New York. "I will no longer have to worry about protocol translations that occur between operating systems" that run on different chips.

Senior West Coast Correspondent Mark Halper contributed to this report.

Switch provides fast backbone

Stephen P. Klett Jr.

Grand Junction Networks, Inc. last week rolled out a new version of its 10/100 Ethernet switch that provides a 100M bit/sec. or "fast" Ethernet backbone. It is designed to provide users with a more flexible and affordable method of moving their legacy LANs to higher speeds than routers and network switches.

Some observers, however, questioned Grand Junction's strategy of using 100M bit/sec. Ethernet as a backbone compared with the more traditional Fiber Distributed Data Interface (FDDI) backbone.

The FastSwitch 10/100 AG is a stackable Ethernet switch that has four shared and one dedicated 100M bit/sec. Ethernet ports in addition to 25 dedicated 10M bit/sec. ports. Grand Junction's first switch — the FastSwitch 10/100 — has only two dedicated "fast" Ethernet connections.

The FastSwitch 10/100 AG's four shared 100M bit/sec. Ethernet ports let users aggregate multiple 100M bit/sec. Ethernet switches and repeaters to build larger high-performance LANs using a 100M bit/sec. Ethernet backbone. The switch can support a maximum configuration of two FastSwitch AG switches. Each switch connects to three FastSwitch 10/100 switches that connect up to 200 users and eight servers at a cost of about $300 per port.

"Fast" connection

Grand Junction's 10M bit/sec. and 100M bit/sec. products allow users to install high-speed LANs in small increments

Product	Price	Price per port	Available
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FastSwitch 10/100 (UTP)*	$7,950	$294	Now
FastNIC 100 EISA (UTP)*	$499	N/A**	This month

*Unshielded twisted-pair **N/A = Not applicable

According to Grand Junction, this price point makes 100M bit/sec. Ethernet-based LANs a viable alternative to FDDI-based LANs, which can be double or triple the cost to install.

Analysts said the FastSwitch AG offers users a new level of flexibility by letting them build small, high-speed workgroups and LANs that can be scaled up as needed at a relatively small incremental cost. But while a stronger case could be made for 100M bit/sec. Ethernet than for FDDI, analysts said, FDDI is a superior choice in the backbone.

"Grand Junction appears to have made some assumptions about being able to position [themselves] against FDDI that are not rooted in reality," said Kathryn Korostoff, president of Sage Network Research, Inc. in Natick, Mass. "Fiber is a better choice because it is inherently more reliable than copper and spans longer distances."

"Users should think twice about investing heavily in 100M bit/sec. Ethernet until it matures" — for example, standards are set and more interoperable products become available, agreed John Morency, principal analyst at Strategic Network Consulting, Inc. in Rockland, Mass.

But at least one beta site says 100M bit/sec. Ethernet may be mature now. Adolph Zimmerman Organization, Inc., an engineering company in Memphis, is installing a FastSwitch 10/100 AG and four FastSwitch 10/100 switches and will likely add a second FastSwitch AG by year's end, said Fran Glasco, MIS manager. "We believe switched 100M bit/sec. Ethernet is the safest bet to relieve network congestion because it provides the biggest bang for the buck," Glasco said. While "only time will tell," he said he expects the network's performance to rival that of an FDDI network when fully installed.

Regardless, Glasco said the switch should improve the performance of the company's 10Base-T network. For example, transferring a 30M-byte AutoCAD file between two networked servers takes 23 minutes. The FastSwitch 10/100 AG completes the task in less than seven minutes, he said.

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Users told to forge ahead with object technology

By Melinda-Carol Ballou

At Object Expo last week, key corporate developers and early explorers in the domain of object technology gave attendees this advice: Get going despite the pitfalls and confusion, but plan well and begin with smaller projects.

Despite acknowledging that the current solutions are "far from what we need and are a long way from where we're going to be," Colin Crook, senior technology officer at Citicorp, used his keynote address to urge users to begin the journey.

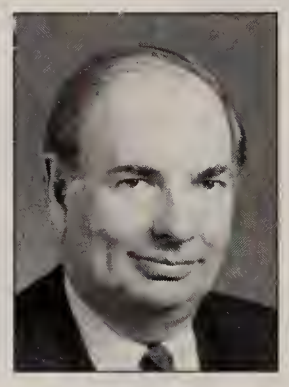
"Shall I delay or deliver? The answer is 'deliver,'" Crook said. Ultimately, shortcomings will be sorted out, he said, adding that object-oriented technology "is critical."

From Crook's perspective and that of other developers at the conference, a key benefit of object technology is the way it lets applications that run the business incorporate business processes, providing flexibility, quick turnaround and easy maintenance.

Brooklyn Union, for instance, jettisoned legacy applications that ran the New York energy company and created object-oriented applications to replace them. It had become increasingly difficult to maintain the legacy code, according to Joseph Nogan, an information systems planning consultant who spoke at a briefing sponsored by Andersen Consulting.

"The reason why we were put in that position was that the structured programs didn't preserve the application description. We couldn't find [data] . . . or do what our [business] users asked us to implement," Nogan said. "With the new object-oriented application, the top layer is the user interface and the next layer is business function."

Other benefits of object-oriented development include the ability to encapsulate and reuse code, letting developers benefit from and build on previous work, developers said. And once the learning curve is surmounted, it is possible to develop more efficient code more quickly than by using procedural programming, some developers said.



Citicorp's Colin Crook *urges developers to use object technology, saying shortcomings will get sorted out*

But making the transition is not easy.

"Though we shipped products, it was not without a lot of grief and pain," said Blayne Maring, area vice president of architecture at GTE Telephone Operations in Irving, Texas. "A major benefit of object-oriented technology is reuse, but getting reuse is hard. It's a management problem."

GTE incentives and rewards for reuse, together with a methodology that requires the use of templates, helped his organization achieve reuse rates of about 90%, Maring said.

The standard reuse rates for experienced sites using object-oriented development techniques is usually only about 60%, according to Maring.

Everyone counts

Management champions for object-oriented development can make the difference in terms of both code reuse and the success of the project, according to Elizabeth Flanagan, manager of Network Applications Information Services at Home Box Office in New York.

But managers themselves are often reluctant to embrace a new technology they know less about than do the developers they manage, Flanagan said. "The managers must make the paradigm shift also," she said.

On the other side, managers who have seen all the hype about code reuse and increased productivity may also expect an immediate payback from bringing in object technology. That is unrealistic, some developers warned.

"On your first attempt with objects, don't assume you'll get any benefits. It's expensive, painful and you'll make lots of mistakes," Maring said. "The benefits come the second and third time around."

Survival tips for the trek to objects

The following are 10 tips from information systems pros who have traveled the path to object-oriented applications development:

- Choose small pilot projects, not large mission-critical applications, for your first project.
- Get management champions fully behind the project.
- When deciding among the multiple options available, focus on the problem to be solved and risks to be avoided.
- Manage expectations: Do not count on immediate benefits from your first project.
- Work on changing the way you think; object-oriented programming requires a paradigm shift.
- Perform biweekly reviews of the team's progress, and plan for code reuse.
- Make sure technology groups form partnerships with business clients to ensure that business processes and needs are incorporated into the application model.
- Bring in knowledgeable, experienced object-oriented developers to act as mentors and to help with technology transfers.
- Maintain ongoing contact with business partners as the project progresses.
- Do a postmortem of the process once the project is completed.

Re-engineering slammed

CONTINUED FROM PAGE 1

turf battles, a lack of management buy-in and inadequate implementation skills.

Meanwhile, another as-yet-unreleased 500-company study recently completed by the granddaddy of re-engineering consultancies — CSC Index, Inc. in Cambridge, Mass. — found the re-engineering dissatisfaction rate "closer to 50%," said Gary Gulden, an executive vice president at CSC Index.

IS gets blamed

Corporate IS departments have been especially hard hit by re-engineering fiascos, according to Scott-Morgan.

Re-engineered IS "departments are being downsized, then told, 'We need all of you to pull together on cross-functional teams,'" Scott-Morgan said. Yet the performance rewards available to information technology staffers, such as interesting development work, demand a high degree of individual effort. The upshot is that IS "departments are quite often downsized, only to be set up between a rock and a hard place," he said.

IS departments also suffer when the user groups they serve are downsized in the name of re-engineering, said Ken Harris, vice president of worldwide IS at Pepsico, Inc. subsidiary KFC Corp. in Louisville, Ky.

"I've seen a lot of situations where companies have reduced head counts with the idea of putting replacement technology in," Harris said. "But then the resources get pulled before the technology is ready, and [IS] gets blamed for the failure."

> "Re-engineering is increasingly being used as a euphemism for downsizing."
> *Peter Scott-Morgan, Arthur D. Little*

Scott-Morgan and Gulden both said they have observed the same phenomenon.

"What's happening is that re-engineering is increasingly being used as a euphemism for downsizing," Scott-Morgan said. "Interestingly, there's a very close correlation between companies in industries that went through the largest downsizings and those where re-engineering dissatisfaction is highest."

Yet companies continue to downsize in the name of business redesign — even those in good financial stead. Last week, Chicago-based Sara Lee Corp. announced that it intends to cut 6% of its worldwide work force at a time when the company "is strong and on course for another record year," according to Chairman and Chief Executive Officer John H. Bryan. "Our ability to remain a growth company, competing effectively in rapidly changing markets both today and in the future, requires these actions," Bryan said.

Speed it up

Still other companies, such as Scott Paper Co., are accelerating their downsizing pace. Earlier this month, the Philadelphia company's new Chairman and CEO Albert J. Dunlap — also known as "Chainsaw" or "Rambo" by employees — told stockholders he would cut 8,300 workers by year's end. The reductions, announced in January, were originally scheduled to occur during the next two or three years. For now, the company is not saying how the cuts will affect its corporate IS department.

So in the face of a minimum 50% failure rate, why do companies continue to re-engineer?

"It's human nature to defend what you've done," Gulden said.

NT server luring Novell users

CONTINUED FROM PAGE 1

ed reseller in Bethesda, Md.

Let the games begin

The real face-off is likely to start when both Daytona and NetWare 4.1 start shipping. Little Rock Wastewater Utility, for example, is considering Daytona as a replacement for NetWare. "But first I want to see NetWare 4.1 running head to head against Daytona," said Ed Hiller, data processing supervisor at the Little Rock, Ark., utility.

Microsoft, meanwhile, is equipping Daytona with a raft of features designed to make it as easy as possible for users to insert NT servers into existing NetWare installations and then migrate from Novell's to Microsoft's platform (see chart).

Copycat

THE UPCOMING DAYTONA VERSION OF MICROSOFT'S WINDOWS NT WILL SHIP WITH THE FOLLOWING NETWARE SUPPORT FEATURES:

- Full 32-bit support for the IPX/SPX transport protocol.
- Client software that provides full access to NetWare 3.x services. However, support for NetWare 4.x or NetWare Directory Services is still uncertain.
- Systems Management Service, which will provide inventory management, diagnostics and software distribution for NetWare clients, as well as for NT and Windows clients.
- An enhanced version of the Remote Access Server, which enables remote clients to access NetWare files through an NT server.

Users now shopping for servers said the upcoming NT Advanced Server version offers a number of significant advantages over NetWare. One of the biggest is superior TCP/IP support, said Jim Dunham, a network engineer at Darby Group Cos., one of the nation's largest medical products distributors and a Daytona beta site.

The system's support of Dynamic Host Control Protocol (DHCP) enables the network administrator to automatically configure TCP/IP on new workstations, making the company's rollout of a corporatewide TCP/IP network "so much easier," Dunham said. Novell has yet to announce DHCP support.

The Daytona version of NT Advanced Server will also make a big leap in manageability, given that it is scheduled to ship with Systems Management Server (also known as Hermes), said Ted Vegvari, a network design specialist and consultant in Torrance, Calif.

Ahead of the game

Furthermore, Microsoft is already ahead of Novell in providing a graphical front end and utilities to facilitate server configuration, Vegvari added. "I have been to classes where 30 people that have never done a network set up [NT Advanced Server] in an hour."

Full-featured TCP/IP support and performance are the two main items on the NT Advanced Server wish list of Michael Cottenben, director of the advanced technology group at Dylex Ltd. "We are very much committed to Microsoft's direction," he said. The Toronto retail chain is in the process of converting the NetWare servers at its headquarters to NT, he added.

According to users, the upcoming NT Advanced Server version offers a number of significant advantages over NetWare.

To make NetWare-to-NT migration easier, Microsoft is working on a NetWare Upgrade Kit similar to its LAN Manager Kit, said Claude King, a senior systems analyst at the University of Florida College of Journalism and Communications. To be sold as an option, the kit automatically collects user information such as password and account from NetWare 3.x binderies and ports it to NT-based accounts and directories, he added.

Also shipping with Daytona, Microsoft said, is an enhanced version of Microsoft's Remote Access Server that has the ability to provide remote clients with access to NetWare files.

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News Shorts

FCC approves wireless radio spectrum

The **Federal Communications Commission** last week approved a plan to allocate radio spectrum for wireless personal communications services (PCS), including wireless LANs. However, the agency backed away from an earlier plan to allocate 20 MHz to data PCS and earmarked 10 MHz instead. **Apple Computer, Inc.**, which led the industry in lobbying for a chunk of the airwaves devoted to unlicensed data PCS, said it has assurances from the FCC that it will find an additional 10 MHz in an uncrowded part of the spectrum. Apple would not comment on its plans for PCS devices, but last month the company demonstrated to Congress a PowerBook portable PC that could access the Internet via a radio link.

Mips rolls out 64-bit RISC chip

Mips Technologies, Inc. announced the 64-bit R8000 RISC chip last week, which will ship in **Silicon Graphics, Inc.**'s Power Challenge supercomputer-class servers next month. Mips, a Silicon Graphics subsidiary, said the chip was jointly developed with **Toshiba Corp.** as the first superscalar implementation of the Mips chip architecture.

Sun, Amdahl score with Charles Schwab

Charles Schwab & Co. has chosen **Sun Microsystems, Inc.** and **Amdahl Corp.** to supply, integrate and maintain systems that will support the brokerage firm's entire branch organization and call-center network. In the coming years, Sun will provide Schwab with 5,000 workstations and 1,000 servers, while Amdahl will act as the prime contractor for service and support. The new systems are a key component of a seven-year project to migrate Schwab's centralized retail brokerage operations to client/server.

Chipcom stacks five-layer architecture

Chipcom Corp. in Southboro, Mass., will announce today a five-layer network management architecture that meshes intelligent switching hub, LAN management and network analysis applications under one umbrella. The layers consist of domain, device, advanced network analysis and logical and virtual network management. The company also unveiled the first components of its Ondemand management application suite, aimed at integrating all the tools needed to manage a network based on its line of intelligent switching hubs.

AT&T has metro fiber-optic ring service

AT&T Corp. last week launched a metropolitan fiber-optic ring service, putting itself squarely into competition for the access dollars of large corporate customers. Accu-Ring, which AT&T will configure from existing access networks in virtually all the top business markets, will offer 45M bit/sec. and higher bandwidth and will be centrally managed by AT&T.

Citibank signs up with NYCE network

After years of turning a cold shoulder to the largest electronic funds transfer network in the Northeast, **Citibank NA** finally joined the **New York Cash Exchange** (NYCE) network. The move to NYCE, which Citibank officially launched April 1 but did not publicly announce, is expected to give its U.S. customers increased access to merchant point-of-sale systems.

SHORT TAKES **Clinical Information Networks, Inc.** in Atlanta introduced the first operating room decision-support system designed to analyze and control surgery costs.... Desktop mapping vendor **MapInfo Corp.** in Troy, N.Y., began shipping MapInfo Version 3.0 for Windows at a price of $1,295.

IBM plans SMP/MPP combo

By Jean S. Bozman
SOMERS, N.Y.

To improve the scalability of its forthcoming Unix symmetrical multiprocessing (SMP) applications, IBM plans to add SMP modules to its IBM SP/2 massively parallel processor (MPP) in 1995, IBM executives said last week.

The addition of SMP boards could not have happened sooner, IBM said, because the Power2 chips now used in the IBM SP/1 and SP/2 were not designed for symmetrical multiprocessing.

"The SMP designs are PowerPC designs," said Bill Filip, IBM vice president and general manager of IBM's RISC System/6000 division here. "We had to get the [PowerPC] 601 out on the street first."

The 601 chip first appeared in an RS/6000 workstation last fall. Even so, IBM has claimed that its uniprocessor Power2 can outperform some SMP Unix machines. Last month, IBM claimed that its RS/6000 59H server bested a Sun Microsystems, Inc. eight-way SMP server.

However, IBM may wait for the high-end PowerPC 620 before trying the SMP/MPP combination, said Irving Wladawsky-Burger, general manager of IBM's Power Parallel Systems. "The PowerPC 620 will be [available in] an SMP chip set, and we will use that on a board as a component of the parallel system," he said.

The PowerPC 620 chip is scheduled to ship next year, IBM said. PowerPC 604 chips are set to ship later this year.

IBM's Irving Wladawsky-Burger: *IBM will wait for PowerPC 620*

Industry analysts said the lack of a precise plan may indicate that IBM is testing the marketability of the idea, with an eye on keeping the market space clear from MPP competition.

Design benefits

News of IBM's plan precedes the announcement of the first SMP RS/6000s based on PowerPC 601 RISC chips [CW, Feb. 7], which was pushed back from summer to fall. But industry analysts said other MPP vendors, including Convex Computer Corp. and Intel Corp, have tried similar SMP/MPP designs to overcome system-bus saturation associated with pure SMP designs [CW, June 6].

"The advantage of distributed memory is that it is scalable," said Chris Willard, manager of high-performance technologies at International Data Corp. in Mountain View, Calif. "With SMP, eventually you get too many processors for the memory bus to handle."

Users would also be better able to match memory with CPUs than with traditional SMP machines, Willard said. "Every time you add processors, you're also adding the extra memory performance."

Connection to System/390 systems through an IBM Escon high-speed data channel will be key to using IBM SP/2 systems for mission-critical tasks, according to IBM.

"There will also be a growing commonality and synergy between the MPP and SMP lines based on the same architecture," said Thomas Kucharvy, president of Summit Strategies, Inc. Users will benefit as low-priced RISC hardware replaces mainframe components.

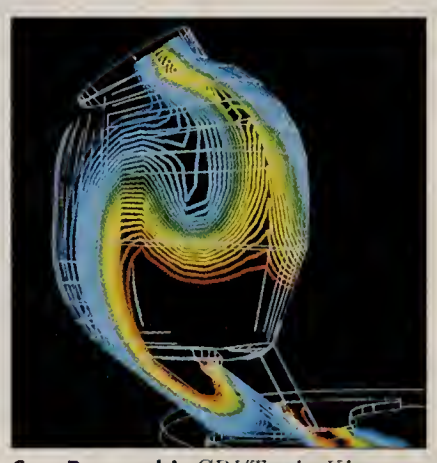
Alliance targets commercial MPP apps

By Gary H. Anthes
WASHINGTON

Looking for new missions in the post-Cold War era, two government nuclear weapons laboratories last week joined 17 companies in a $52 million effort to apply massively parallel computing to a wide variety of industrial applications.

Cray Research, Inc. and the U.S. Department of Energy announced a cooperative research agreement in which the government agency and industry will evenly split the cost of developing commercial software in areas such as environmental modeling, petroleum exploration, materials design, advanced manufacturing and systems software for massively parallel computing.

"For the first time, we will be operating top-end supercomputers for the exclusive purpose of developing software applications with the industry," Energy Secretary Hazel O'Leary said in a statement.



Cray Research's *CRI/TurboKiva, a software environment, simulates the engine combustion process*

Back to reality

The 15 projects in the overall program are intended to help close the gap between the promise and the reality of massively parallel processing (MPP). Most experts believe that computers with multiple processors — potentially thousands — hold the promise of solving the so-called "grand challenges" in science and industry. These include problems such as weather forecasting, pharmaceutical development and microelectronics process modeling.

However, MPP systems have not found widespread use because the software is relatively immature.

In one of the projects, Cray Research will team with archrival and parallel processing pioneer Thinking Machines Corp. in Cambridge, Mass., to develop common programming conventions for MPP machines. Lack of compatibility between different MPP architectures has slowed the adoption of MPP systems.

Nice to be included

The inclusion of Thinking Machines is significant. In 1992, an aborted $72 million deal involving Cray Research and the national laboratories was criticized for allegedly giving Cray an unfair competitive advantage.

This time around, in another project, International Technology Corp. in Torrance, Calif., Lawrence Livermore National Laboratory and Cray Research will develop software to model the flow of underground pollution.

"We expect, conservatively, a savings of 10% on remediation work because the greater accuracy of the modeling will mean we don't have to over-design our cleanup efforts," said Thomas Fogwell, project manager at International Technology.

In a third project, Biosym Technologies, Inc. in San Diego and Los Alamos National Laboratory will develop models to help improve casting and welding processes.

CUSTOMER ALERT

dBASE users discover FoxPro 2.6 falls short

"FoxPro 2.6 fell well short of the claim in [Microsoft] ads that 'the unique AutoMigrate feature lets you move your existing dBASE files effortlessly into FoxPro.'"

"The simplest crash was triggered just two keystrokes into the program."

"Microsoft officials reported that the problem was that FoxPro is unable to handle certain dBASE statements."

"When we attempted to migrate our art gallery management system to FoxPro, the whole process was frustrating."

"Our tests turned up a surprising number of bugs, errors and crashes involving these new features..."

"This reviewer, a dBASE user and programmer, tried unsuccessfully to "AutoMigrate" the target application rather than performing the relatively laborious task of learning a complex new software platform. In the end however, that is what FoxPro 2.6 required."

"FoxPro for Windows crashed several times when generating a project involving dBASE code."

"Besides these compatibility shortcomings, there are also design flaws that make 2.6 unsuitable for a tentative user."

PC WEEK review exposes compatibility flaws

May 16, 1994

The closer dBASE® for Windows gets to shipping, the more Microsoft seems compelled to cover FoxPro compatibility flaws with untrue marketing claims. Perhaps they've seen how easy dBASE for Windows makes it for all developers to create great Windows database applications using their existing knowledge of dBASE. Perhaps they've seen how naturally applications created with dBASE for Windows can be upsized to client/server applications. Perhaps they've seen how its new "Plug-and-Play" Architecture makes dBASE for Windows totally open to work with your favorite tools and important local and SQL data.

Whatever the case, reacting by claiming that FoxPro addresses dBASE customer's needs is irresponsible. But don't take our word for it. Read the May 16th *PC WEEK* review for yourself.

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Users applaud Intersolv changes

By Melinda-Carol Ballou

Users at the Intersolv, Inc. user conference last week responded enthusiastically to both the company's update of its Excelerator II object-oriented design tools and the aequisition of Q+E Software earlier this year.

Most significant in Release 2.0 of Excelerator 11 are support for Mierosoft Corp.'s Windows NT and Win32s as well as OS/2. Also key are new links between Excelerator and Intersolv's APS client/server tools and the ability to document and map applieations to network environments via enhaneements to the Client/Server Network Model. Excclerator 11 also now runs on Version 7 of Oraele Corp.'s relational database management system.

With the network model, users map an applieation under development to speeifie databases by drawing it on screen. Exeelerator II then ereates Dynamic Link Libraries (DLL) for the targeted database, eompany officials said. In coordination with APS, the application ean also target a range of platforms and operating systems, they said.

"This release was perfect timing for us. It's a big benefit to be able to jump from the logical models [of our applieations] to pulling in relational [data]," said Don Stoller, direetor of systems development at Best Produets Co., a Riehmond, Va., retailer. "We've just started testing this release, and some of the DLLs that we generated work really well."

Ready to go

Excelerator II 2.0 is shipping now at a price of $4,000. Earlier versions were priced at $6,500.

"Now we ean take logieal models and create relational DLLs to target multiple databases [automatically] using the new version," said Greg MeDonald, a tool consultant at Home Savings of Ameriea, a federal savings bank in Irwindale, Calif. "We're also very much interested in Q+E's [Open Database Connectivity] drivers to act as middleware to give us aeeess to a range of data."

Users, however, said they look forward to tighter integration between Intersolv's Exeelerator II and APS tools at the level of Intersolv's repository due out next year.

"I would prefer a eleaner fit to take data bidireetionally back and forth," MeDonald said.

Customizing capabilities

At the conferenee, other issues that appeared uppermost on users' minds ineluded the transition to object-oriented development using a mix of appropriate tools sueh as Intersolv's Exeelerator II and thc ehallenge of using a hybrid mix of methodologies.

"We like being able to eustomize Exeelerator II to fit our methodology," said Pierre Mercier, project manager at DMR Group, Inc., a Montreal-based systems integrator and eonsulting firm. DMR uses its own object-oriented methodology and is able to combine the multiple objeet methodologies supported by Intersolv — which include object methodologies sueh as Rumbaugh, Jaeobson and others — with its own.

Industry analysts praised Intersolv as the first commereial tools vendor to offer support for object methodologies.

"KnowledgeWare, Inc. and Texas Instruments, Inc., for instance, don't yet have object-modeling capabilities, and by the end of the year, Exeelerator II will be supporting elass library development directly out of the tool set, whieh is currently a hole for them," said Peggy Ledvina, an analyst at Meta Group, Inc.'s Reston, Va., office.

Intersolv widens operating system support. See page 108.

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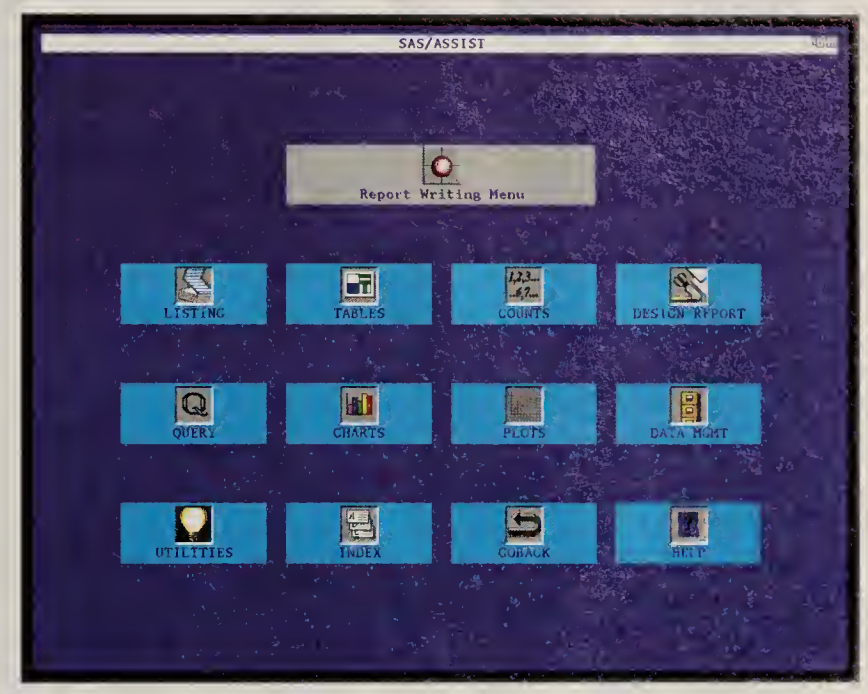

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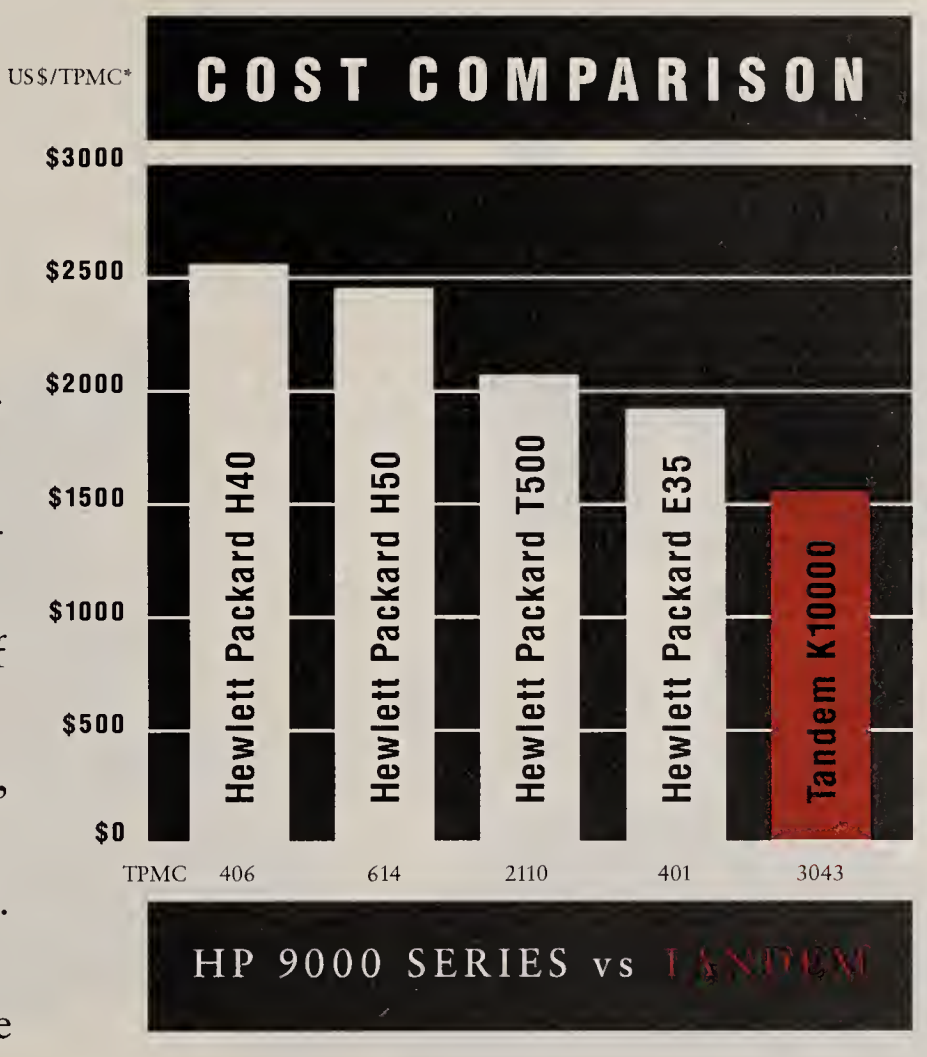

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Sun continues push into high-end server arena

By Jean S. Bozman
SAN FRANCISCO

Sun Microsystems, Inc. is gearing up to make its enterprise server message stick with the more than 12,000 users expected to attend this week's SunWorld 1994 here. Industry analysts said the $4.3 billion vendor has to move quickly into the enterprise server market to compensate for declining prices in the low-end workstation market where Sun still dominates.

For the past two quarters, Sun's workstation sales have not grown as quickly as those from rivals such as Hewlett-Packard Co., said Dominic Ricchetti, director of worldwide workstation research at Dataquest, Inc. in San Jose, Calif.

"Sun's growth from year to year is much slower," added Laura Segervall, manager of workstation research at International Data Corp. in Mountain View, Calif., comparing 1993 with 1992. "But you also have to realize they are shipping twice the volume that the next competitor is. It's much easier to grow faster if you're starting from a smaller base."

In 1993, Sun's workstation-related revenue was $3.5 billion, compared with HP's $2.2 billion, she said.

Eric Schmidt, Sun's chief technology officer, said the company's client workstation sales are growing overall, averaging 10 client sales to every server sale.

"There's this funny buzz in the system that says people aren't buying as many clients," Schmidt said last week. "Unix clients, particularly Sun clients, are getting very powerful and very inexpensive. There's no question servers are more profitable than clients, but you really need to offer both."

Win some, lose some

Users at several Sun sites said Sun's SPARC machines offer better price/performance than some workstations from HP, IBM and Silicon Graphics, Inc. but not better raw performance in some system categories.

"We've got Suns on the desktop, but we aren't doing much server computing on them anymore," said Michael Pearlman, a systems manager at Rice University's computational and applied mathematics and statistics departments in Houston.

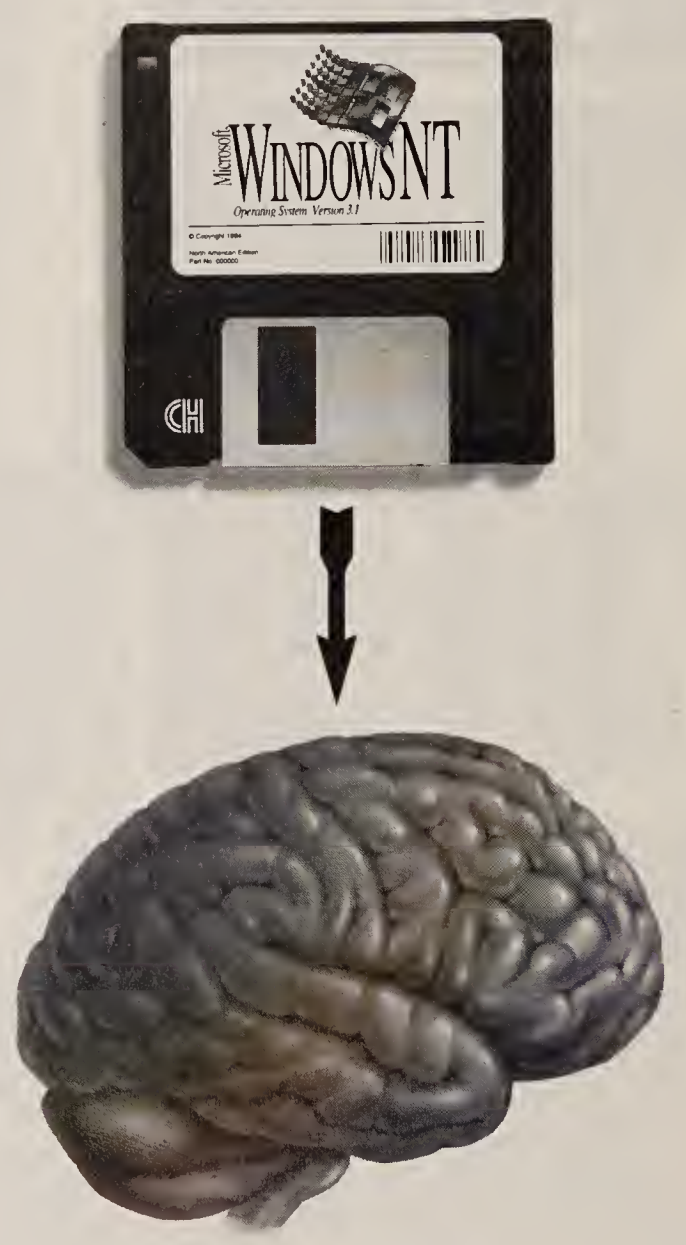
Among the highlights users can expect at SunWorld are the following:

- A customer keynote speech by Bill Alaoglu, director of technology for the World Cup USA 1994 soccer tournament, which starts this weekend with a series of games across the U.S. World Cup uses two SPARCcenter 2000 high-end servers and 1,000 Sun workstations for major operational applications.
- A panel discussion with users from sites relying on Sun servers as strategic platforms. Next Computer, Inc. Chief Executive Officer Steve Jobs and SunSoft, Inc. President Ed Zander are scheduled to participate in a panel discussion with information systems executives from World Cup and Swiss Bank Corp.

Back from the brink

The Sun User Group, Inc. miniconference at SunWorld will be the group's first collaboration with the annual show, said Alex Newman, executive director of the Brookline, Mass.-based user group.

"This will be the conference that reminds people that the Sun User Group is not only surviving but thriving," Newman said. The group has been operating under Chapter 11 bankruptcy since 1993, and its last technical conference, held in December 1993 in San Jose, Calif., drew fewer than 300 users.



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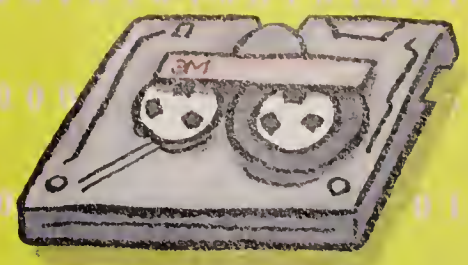

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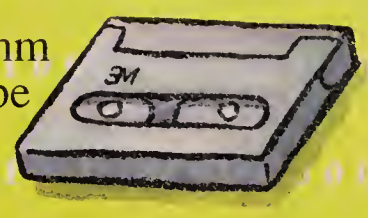

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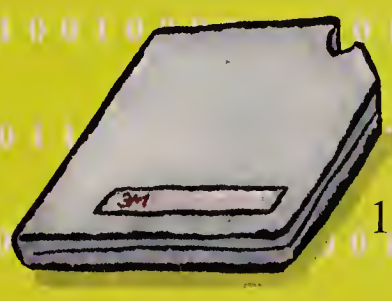

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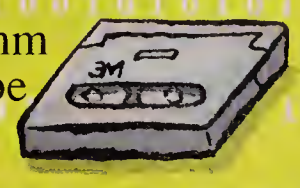

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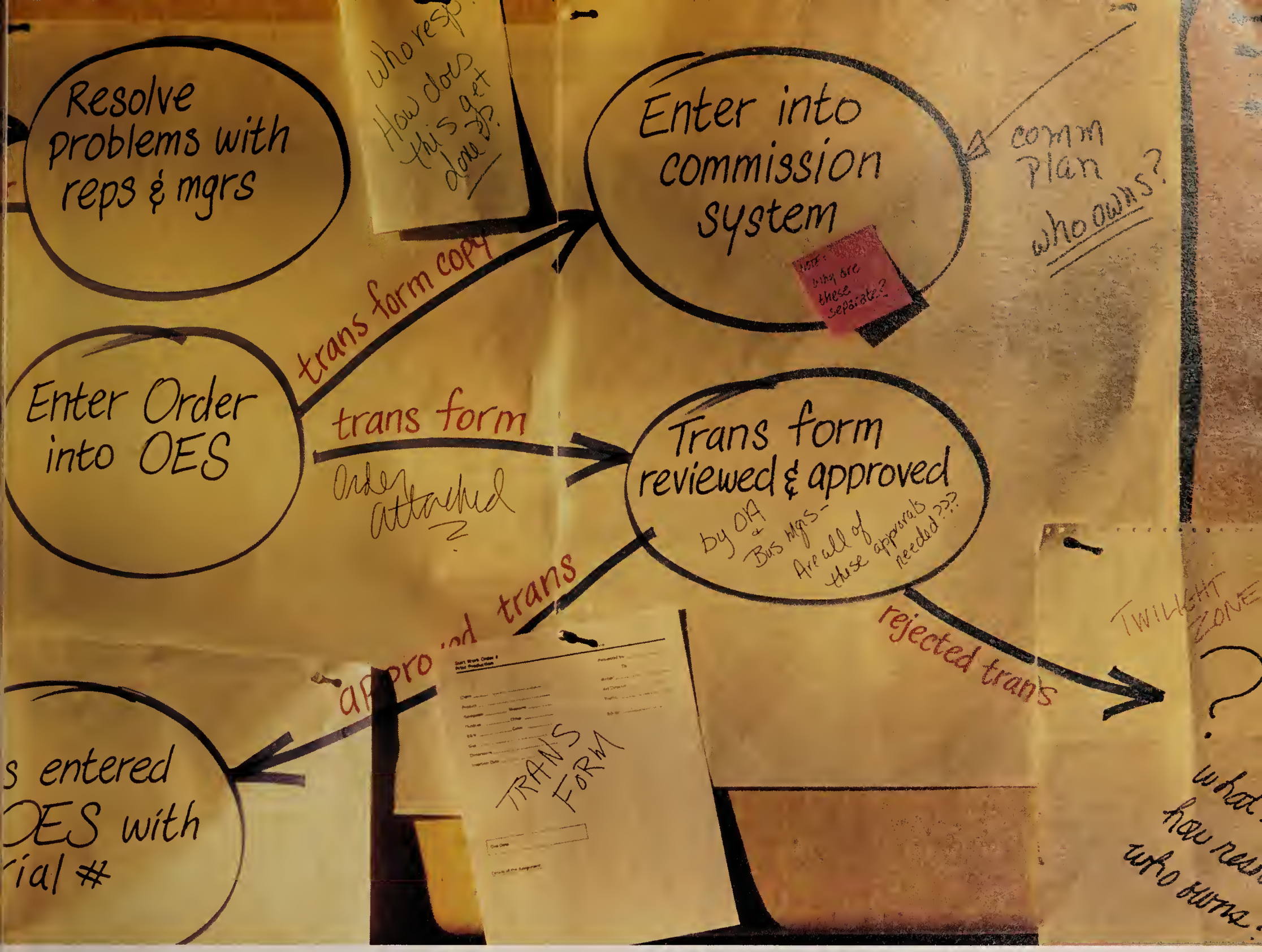

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Awards Spotlight High-Tech Heroes

FROM HELPING LOS ANGELES planners rebuild inner-city neighborhoods to bringing prehistoric monsters alive on the movie screen, a host of innovative uses of technology were honored last week at the Sixth Annual *Computerworld* Smithsonian Awards.

More than 800 computer industry leaders and information systems professionals gathered at the National Building Museum in Washington to honor this year's award recipients (see box below).

The awards not only recognize the winners but create a "wave of applications that spread the word about the achievements of the information technology industry" and its impact on society, said Patrick McGovern, chairman and chief executive officer of International Data Group (IDG) and chairman of the awards committee.

In addition to 10 industry awards, five individuals were singled out for their outstanding dedication as IS pioneers. Among them were Seymour Cray, founder of Cray Research and Cray Computer Corp., and Douglas Engelbart, inventor of the computer mouse.

"Future generations will want to know how information technology changed the world," McGovern said. "Here are the applications, here are the heroes, here is the history."

The awards not only recognize the winners but create a "wave of applications that spread the word about the achievements of the information technology industry."
— Patrick McGovern
IDG CEO and chairman

Four of the 10 awards were given to organizations working to improve the environment. The University of California at Los Angeles (UCLA), for example, was honored for an application created by adapting technology from military flight simulations to aid the city's rebuilding efforts.

"It's an honor that inner-city work can be so amply rewarded," said William Jepson, a professor of architecture and urban development at UCLA.

Industrial Light and Magic, Inc. was awarded for creating the fantastic prehistoric environment in Steven Spielberg's film *Jurassic Park*. Using special digital technologies, the company produced the most compelling and realistic array of dinosaurs ever seen on film for a fraction of the cost of older techniques such as robotic and stop-motion puppet animation.

"Who would have thought that computers and algorithms would be the paintbrush of the future?" said Mark Dippe, Industrial Light and Magic's visual effects supervisor. "We are blessed with the opportunity to create images never seen before."

—Erin Callaway

1

2

THE WINNERS

1994 Computerworld Smithsonian Award Winners

Business and related services
Mervyn's, Inc., Hayward, Calif.

Education and academia
University of California at Los Angeles (UCLA)

Environment, energy and agriculture
The Nature Conservancy, Arlington, Va.

Finance, insurance and real estate
National Association of Securities Dealers (NASD), New York

Government and nonprofit organizations
Massachusetts Executive Office of Environmental Affairs, Boston

Manufacturing
Convex Computer Corp., Richardson, Texas

Media, arts and entertainment
Industrial Light & Magic, San Rafael, Calif.

Medicine
Veterans Administration Medical Center, Cleveland

Science
Los Alamos National Laboratory, Los Alamos, N.M.

Transportation
Qualcomm, Inc., San Diego

1994 Smithsonian Information Technology Leadership Awards

Price Waterhouse Award for Lifetime Achievement
Douglas Engelbart, president
Bootstrap Institute, Stanford University

Cray Research Award for Breakthrough Computational Science
Professors David McQueen and Charles Peskin
Courant Institute of Mathematical Sciences
New York University

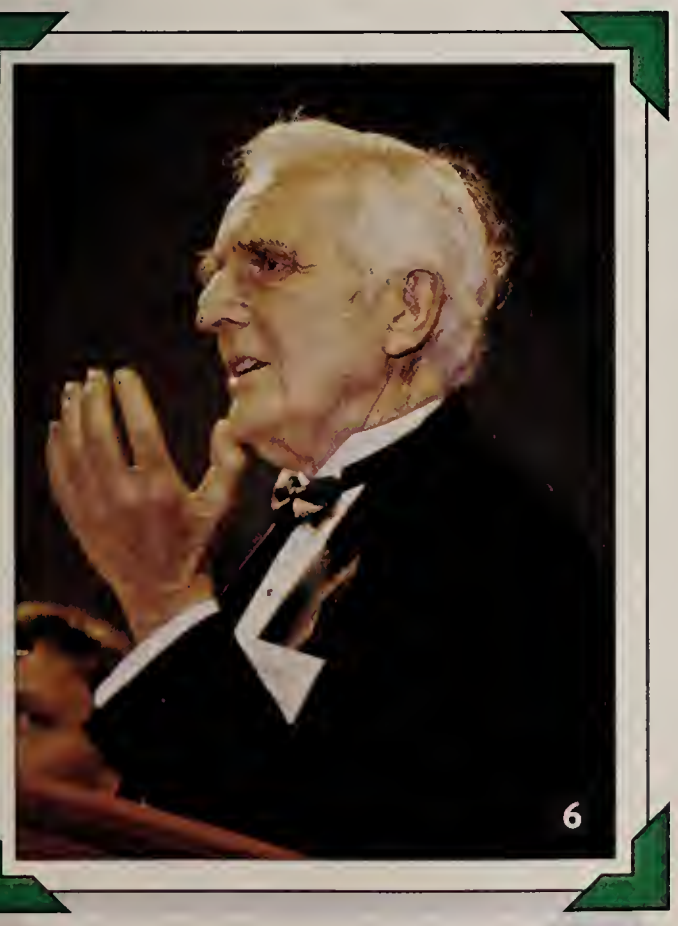
Computerworld Smithsonian Award for Education
Inabeth Miller, vice president of Affiliate Programs, Curriculum Television Corp.

Science Applications International Corp. Award for Global Integration
Lawrence Ellison, president and CEO
Oracle Corp.

MCI Award for Innovation
Seymour Cray, chairman of the board
Cray Computer Corp.

3

Photography by Chip Simons



1. Computerworld Publisher Gary Beach (left) congratulates Larry Ellison, president and CEO of Oracle Corp., on his Information Technology Leadership Award.

2. The cavernous hall of the National Building Museum in Washington played host to the crowd of more than 800 industry leaders and IS professionals.

3. Doyle Baker, director of information resources at Convex Computer Corp., shows off his award in the manufacturing category.

4. Master of Ceremonies John Hockenberry of ABC-TV's "Day One" kept the evening lively with his sharp wit and humor.

5. Seymour Cray, chairman of Cray Computer, autographs a chunk of 4K-byte memory that he invented as David McQueen of NYU's Courant Institute of Mathematical Sciences looks on.

6. Recognized for a lifetime of achievements in computer science, Douglas Engelbart of Stanford University is best known as the inventor of the mouse.

7. The Sixth Annual Computerworld Smithsonian winners gather on stage for a champagne toast.

8. William Jepson of UCLA poses with his wife, Diane O'Brien, after receiving his award.

9. Inabeth Miller of Curriculum Television Corp. regales the audience with stories from the education front.

Chip merges PowerPC, Power lines

IBM to offer greater speed, more power

By Ed Scannell
and Jaikumar Vijayan

IBM is expected to merge its PowerPC and Power lines of RISC processors when the company delivers a 64-bit follow-on to its PowerPC 620 chip in the first half of next year.

The PowerPC 630, so called by sources briefed on the chip, is being developed initially by IBM — instead of jointly by IBM, Motorola, Inc. and Apple Computer, Inc. — in the Austin, Texas-based Somerset Labs. IBM, however, will offer it to Motorola to manufacture.

The PowerPC 630 has a more elegant design than PowerPC processors currently available. Its core processor will sit on one chip but will have a separate cache memory and controller, giving it greater power and speed.

An IBM spokesman confirmed that the company is independently developing a follow-up to its proprietary Power2 chip, which is used in the RS/6000. The new chip is called the PowerPC6xx, he said.

"As part of the agreement, both companies are free to develop chips outside of the [PowerPC] alliance," the spokesman explained, referring to IBM's independent developmental effort on the new processor.

However, because it is aimed at the highest end of the market, the PowerPC 630 will be substantially faster than Power2 processors.

IBM's current Power2 chips run at 71.5 MHz. The PowerPC 630, once called the Power 3, was designed to operate at between 300 and 400 MHz. Digital Equipment Corp. has the fastest chip currently available with the 275-MHz version of its Alpha chip.

Just two weeks ago IBM introduced its 67-MHz Power2-based 3BT workstation, a system the company claimed outperformed Hewlett-Packard Co.'s 125-MHz HP 9000 Model 735 desktop machine in floating-point performance.

Not for everybody

Observers say the PowerPC 630 will be scaled up for use in mainframe-class machines. But because of its high development costs, most say they do not think it will be positioned for the general purpose market.

In another development, IBM and Motorola's RISC Processor Division jointly announced they are opening a PowerPC-based technical center in Taipei, Taiwan. The center is intended to help both independent software and hardware developers put together PowerPC-based systems.

The technical center will be staffed by IBM and Motorola engineers with specialties in operating systems and device drivers. It will be able to handle training for as many as 40 engineers.

Computerized whiteboard draws some interest but not many buyers

By Lynda Radosevich

While most computer gear is shrinking, a Xerox Corp. spin-off is marketing a pen-based PC on steroids — with a price tag to match — and a plan to replace conference room whiteboards.

LiveWorks, Inc., a Xerox subsidiary formed in April, last week dropped the price of its LiveBoard from $50,000 to $34,900 and enhanced some features in the oversized PC, which sports an interactive pen-based screen and the ability to connect up to 31 remote meeting sites.

But even at its lower price, LiveBoard's market remains unlikely to expand rapidly beyond the 70 or so leading-edge customers garnered since its quiet launch last year, users and analysts agreed.

LiveBoard enables groups of people to write on a screen with a digitized pen just as they could on a conference room whiteboard. The advantage over traditional whiteboards is that users can change or erase the markings and print, fax or store the final images. They can also simultaneously view a screen and annotate the markings.

Sharper image

Enhancements to LiveBoard include higher quality screen resolution for its 67-in. rear projection display and a sleeker digitized pen. LiveBoard also includes a 66-MHz 486 PC, a built-in 14.4K bit/sec. fax/modem and the meeting software.

Users contacted last week said that while the interactive drawing features are interesting, they mainly use LiveBoard as a large conference or training room projection screen.

Defense contractor Martin Marietta Corp., for instance, uses LiveBoard in its training program for submarine crews.

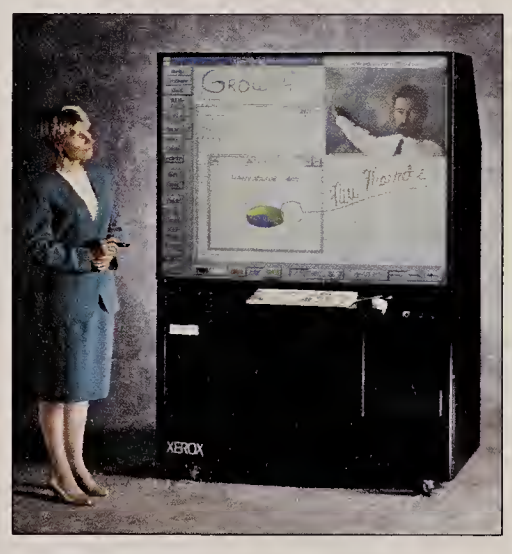
"I've eliminated paper or any writing surface other than the LiveBoard," said Scott Buehler, manager of advanced logistics at the Syracuse, N.Y., Martin Marietta facility. "Instructors like that because their most brilliant descriptions and explanations happen while they are 'chalk-talking' in front of class. In the old days, they'd have to erase that to go on to the next item. Now they can save it and use it again."

Nice idea, but...

At Andersen Consulting's center for strategic technology in Palo Alto, Calif., "we use it like a PC with a very large screen to give presentations and demos to groups of six to 10 people," said Jean Vandevelde, a manager in charge of development at the center. He added that the alternative, a PC with a projector, is more cumbersome and does not permit annotation.

The center also has a PictureTel Corp. videoconferencing unit in the same conference room, so users see a presenter's face on one screen and a demonstration on another screen, Vandevelde said. That capability has been used, for example, to let an Andersen consultant in Chicago give a technical presentation to a Palo Alto audience that included clients, he explained.

Still, analysts remain skeptical about wide-scale implementation.



LiveBoard *replaces a conference room whiteboard*

"It's a neat underlying technology — pen-based object technology — but I'm not sure that most companies can justify the expense for something that they've been doing without," said Ronni Marshak, a vice president at Patricia Seybold Group, a Boston consultancy.

Richard Bruce, LiveWorks chief executive officer, said the product's slow growth is not surprising because it is sold directly, has a long sales cycle and is still an unfamiliar concept to most users.

Meanwhile, analysts said other products perform some functions of LiveBoard at a lower cost. They include a system from Smart Technologies, Inc. in Calgary, Alberta, that costs roughly $23,000 and a noninteractive system from Microfield Graphics, Inc. in Beaverton, Ore., priced at $3,000.

D&B package eases budget creation task

By Rosemary Cafasso

Dun & Bradstreet Software released a PC- and Unix-based client/server budget application last week that works with its SmartStream client/server platform. The product is intended to streamline the burdensome task of budget creation and approval.

"A lot of vendors have been talking about [budget applications], but D&B seems to be ahead of the gang on this," said Jennifer Scholze, a senior analyst at International Data Corp. in Framingham, Mass.

With SmartStream Budget, users will be able to pull approved budget data from a previous year, load it into the new budget plan and then indicate percentage changes, which will be automatically calculated.

Bobby Cameron, an analyst at Forrester Research, Inc. in Cambridge, Mass., said he expects the software could appeal to users who have been relying on a hodgepodge of tools to get budgets done. "Most people do their budget creation and management in spreadsheets and with a great deal of pain and agony," Cameron said.

Bob Marthinsen, a program manager in the information technology group at Alcatel Network Systems, Inc., a telephone transmission systems supplier in Richardson, Texas, said he plans to install SmartStream Budget next month on Sun Microsystems, Inc. machines running Solaris. Marthinsen worked on a customer committee that provided user requirements to the product's development team.

"Most general ledger [applications] have a place to plug in the final numbers, but as far as building one from scratch and moving it through the organization, we hadn't found one," Marthinsen said.

Like many companies, the annual corporate budget process at Alcatel is long and tedious, with 450 departments submitting budgets, and many budgets requiring seven or eight iterations, Marthinsen said.

SmartStream Budget will ship as a stand-alone product with prices starting at $60,000. It requires the SmartStream server software platform, which starts at $100,000. The client portion runs on Windows and makes use of the server facilities within SmartStream, including the workflow function.

Initial versions will run with the SmartStream server on Hewlett-Packard Co.'s HP/UX or Data General Corp.'s DG/UX SmartStream platforms. It will be available on Sun's Solaris and IBM's AIX platforms later this month.

The new package uses Microsoft Corp.'s Excel spreadsheet and includes reporting and analysis functions.

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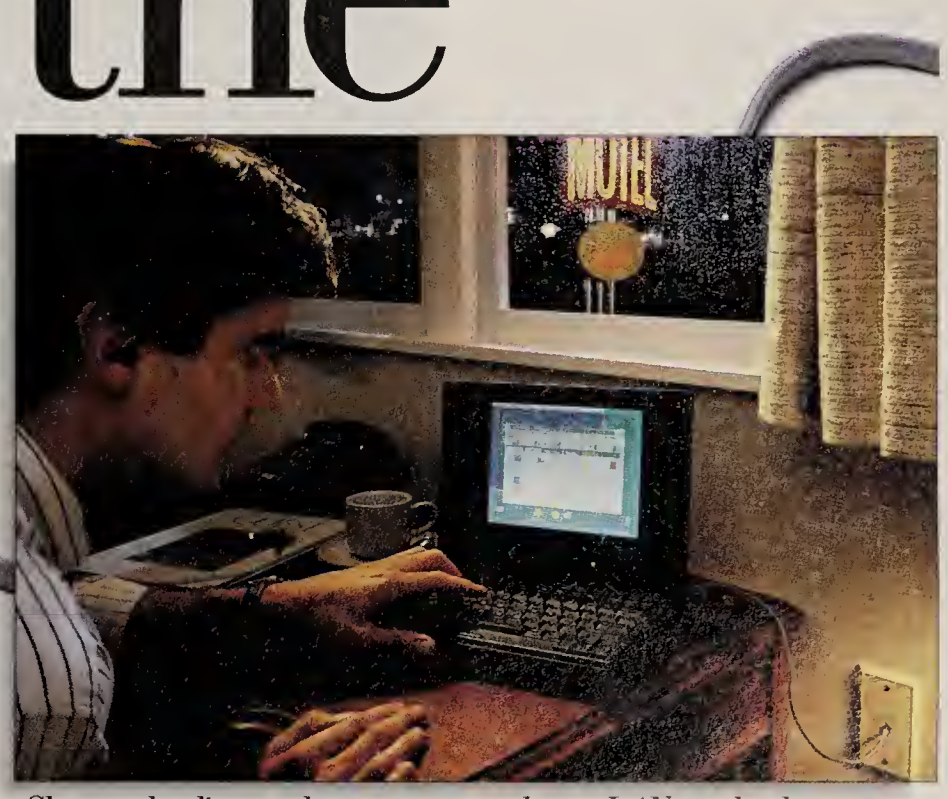

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LAN to Remote	Yes	No	No	Yes
LAN to LAN	Yes	No	No	Yes
Remote Connectivity Sync, ISDN, X.25 (In addition to ASYNC)	Yes	No	No	Yes
LAN Application Interfaces NetBIOS, NetBEUI, 802.2 (In addition to IP and IPX)	Yes	Yes	Yes	No
Security WS Addr., Sec. Admin., Logon Policies, Logon Day/Time (In addition to User ID, Password and Callback)	Yes	No	No	No

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Air traffic control system running aground

The FAA scraps major portions of its $7 billion modernization project; flight delays may increase

By Gary H. Anthes
WASHINGTON

The troubled effort to overhaul the nation's air traffic control system has been drastically scaled back, with the Federal Aviation Administration recently canceling two of the five major system components and trimming a third from its Advanced Automation System (AAS) project.

The moves are intended to stem the tidal wave of red ink from a project that was estimated in 1988 to cost $2.6 billion but is now pegged to balloon to nearly $7 billion.

Air traffic controllers — the eventual users of the new systems — said they will not let safety suffer as a result of the cutbacks. Yet the controllers may be forced to resolve system overloads, an increasingly common event, by increasing flight delays, said Will Faville, director of safety and technology at the National Air Traffic Controllers Association, the labor union for 15,000 U.S. controllers.

The FAA on June 3 grounded the $1 billion Area Control Computer Complex, which was intended to combine two separate systems used to control aircraft near airports and en route between airports. Its objectives can be better met by yet another system — intended to generate conflict-free routes between departure and arrival airports — already under separate development, the agency said.

FAA administrator
David R. Hinson said study indicates software architecture is outdated

The FAA also canceled the $650 million Terminal Advanced Automation System, which was to have replaced hardware and software at facilities that control aircraft within 20 to 30 miles of airports. Instead, an existing system augmented by technology outside the AAS contract will be used.

Change of plans

The FAA also said it will replace workstations, servers and radar screens in towers at only the 70 largest airports, rather than at 150 airports as was originally planned.

Finally, the FAA said it will take an additional 90 to 120 days to review software developed by IBM Federal Systems Co. — which Loral Corp. has since bought — to determine whether it can be salvaged for the Initial Sector Suite System (ISSS). The ISSS is one of the five major components of the AAS and is the one that would replace systems that guide aircraft en route between airports.

In a letter to House Aviation Subcommittee Chairman James L. Oberstar (D-Minn.), FAA administrator David R. Hinson cited a recent study that concluded, "The current software architecture and design for key elements of [the ISSS] is outdated and flawed in many areas, and it is not known whether the software can be made to work at a reasonable cost and schedule."

If the ISSS software does not pass muster, the FAA may have to write off the $1.4 billion it has spent on the software since 1989, Hinson said.

"We are not surprised by these decisions," said Allen Li, associate director of transportation issues at the U.S. General Accounting Office. He said it was "prudent" to do the software audit, citing differences of opinions among parties that have probed the ISSS project.

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Campaign addresses computer ethics 'void'

By Mitch Betts
WASHINGTON

Amidst a flurry of headlines about cyberporn, electronic stalking, computer viruses and privacy invasions, a wide variety of interest groups — including the corporate information systems community — are gathering here next Tuesday to launch a National Computer Ethics & Responsibilities Campaign.

The goal of this consciousness-raising effort is to address the "computer ethics void facing America today," said Peter S. Tippett, a campaign co-chairman and director of security products at Symantec Corp. in Cupertino, Calif. The group's time line is about a year for "getting people to talk about the issues" and about five to 10 years for changing attitudes.

One plan is to create an electronic repository of information resources, training materials and sample ethics codes, available on CompuServe and the Internet. The repository should help IS managers trying to devise internal policies for topics such as customer privacy and the appropriate uses of corporate electronic-mail systems.

In addition to a bevy of associations and vendors, formal sponsors include such IS representatives as the data security officers at Merrill Lynch & Co. and Monsanto Co. The public campaign will supplement their internal efforts of educating end users about issues such as data security and software piracy.

"We can try to erect barriers to intruders, but the bigger challenge is explaining how people should behave [on information networks]," said Ted Gerbracht, vice president of technology risk and protection at Merrill Lynch in New York.

For example, there are issues such as what constitutes plagiarism or libel on the Internet. "We need to get people to ask: 'Is this the right thing to do?' "

Ethics training essential

Furthermore, the campaign will announce programs to support computer ethics training in grade schools. Genevieve M. Burns, manager of data security at Monsanto in St. Louis, emphasized the importance of starting training "as soon as a child touches a keyboard."

Lack of ethical guidance has spawned a "hacker ethic" holding that viruses are intellectual curiosities and that break-ins merely provide a helpful service to the system owner by identifying security weaknesses, Tippett said.

The problem is that the "vast majority of technology users came of age in an environment where there were simply no teachers, no guidelines and no accepted codes of behavior," Tippett added.

The campaign's principal sponsor is the Washington-based Computer Ethics Institute, which wrote the Ten Commandments of Computer Ethics [CW, June 7, 1993]. Other big sponsors include the Software Publishers Association, CompuServe, Inc. and the National Computer Security Association.

Tippett said the campaign will be a "call to action" to make responsible use of information technology a national priority, but it will steer clear of endorsing legislation or judging rights and wrongs.

Data trafficking

A public opinion poll shows Americans are worried about secondary uses of their financial and health records

	FAIR OR GREAT CONCERN
Release of your telephone records to a third party	81%
Release of your credit-card transactions to mail-order firms	76%
Release of your health insurance records to a database accessible to third parties	75%

BASE: SURVEY OF 993 (MULTIPLE RESPONSES ALLOWED)

Source: 1994 study by the American Civil Liberties Union, New York

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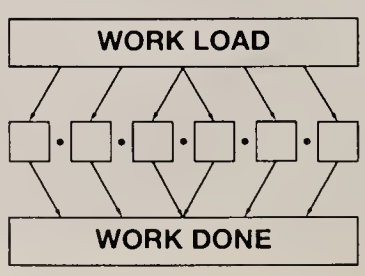

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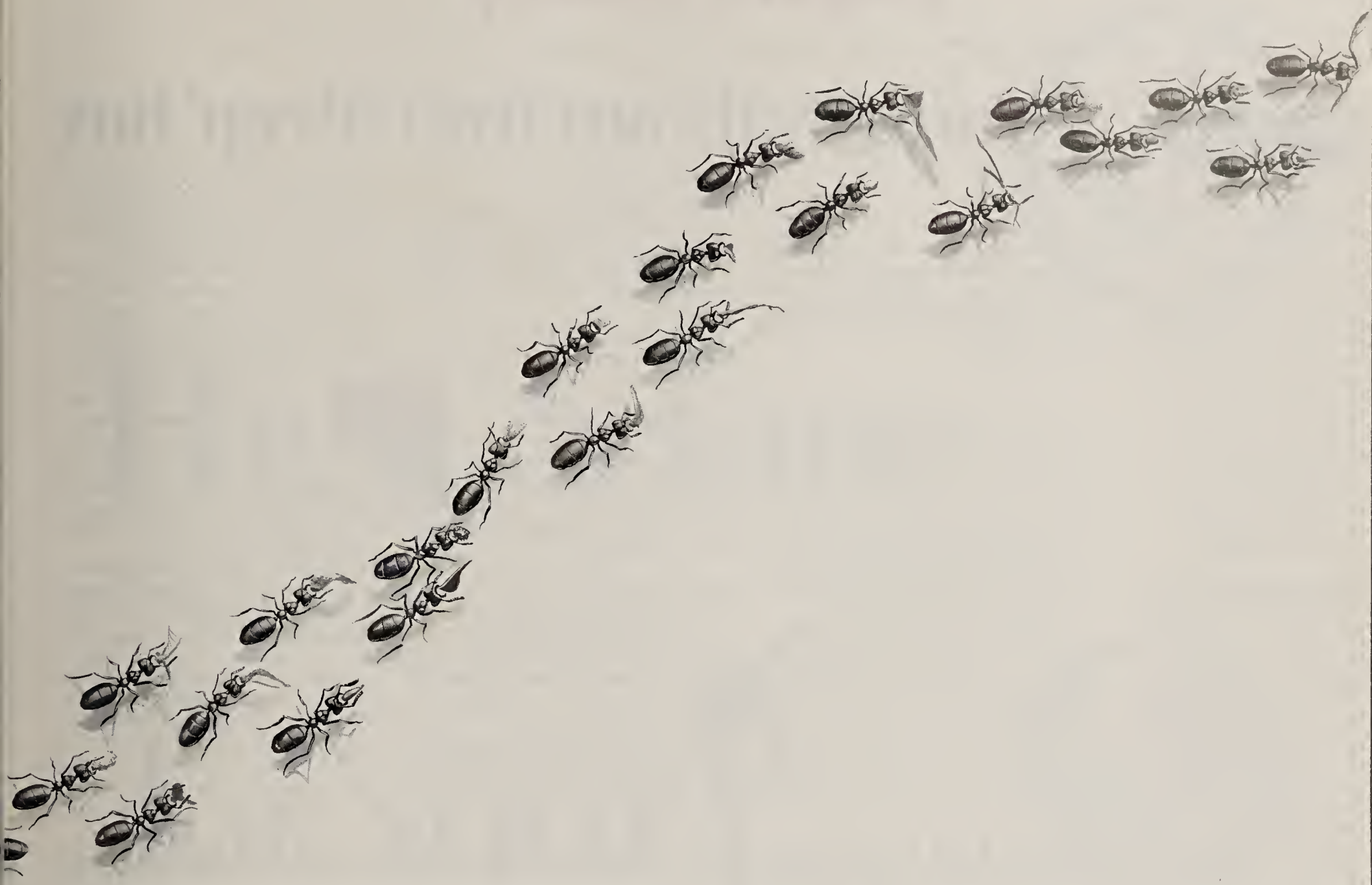

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Briefs

CompUSA sales slip

CompUSA, Inc., the Dallas-based computer superstore chain, last week said sales for the current quarter, which ends June 25, will likely be lower than anticipated, and margins will not improve from the previous two quarters. The company said it will slow current expansion plans to focus on improving the bottom line, adding that if the sales and margin trends continue, it will likely not be profitable in the fourth quarter.

Micrografx posts loss

Micrografx, Inc. in Richardson, Texas, posted a loss of $2.9 million on revenue of $13.3 million for its fourth quarter ended March 31. This compares with a loss of $4.3 million on revenue of $11 million for the same period a year ago. For the fiscal year, Micrografx reported a loss of $3.4 million on revenue of $60.5 million, compared with a loss of $2.8 million on revenue of $56.5 million in 1993.

MMA courts industry

The National Microcomputer Manager's Association (MMA) launched a new industry partner program designed to promote the flow of information technology, ideas and opinions between users and vendors. Vendor benefits include access to MMA members via mailings, a newsletter and meetings.

SHORT TAKES **Pan Technology Computer Corp.**, a Taiwanese PC vendor, has filed suit to stop **Intel Corp.** from using a copyrighted Chinese character set to represent its Pentium name in that country. ... **Boole & Babbage, Inc.** formed a Federal Government Group to focus on client/server and distributed computing needs. ... **Computer Sciences Corp.** acquired **The DiBianca-Berkman Group, Inc.**, consultants specializing in cultural change related to business re-engineering.

Tatung rolls out first 'Prep' box

By Ed Scannell
TAIPEI, TAIWAN

■ Beating IBM out the door, Tatung Corp. last week unveiled an early version of a PowerPC-based workstation that complies with IBM's PowerPC Reference Platform specification, more commonly known as Prep.

The system was demonstrated at the Computex trade show, running a beta version of Windows NT for IBM's PowerPC that is being developed jointly by IBM and Motorola, Inc. The hardware is expected to ship in volume during the fourth quarter. IBM was originally scheduled to deliver its first Prep-compliant system this month but has put off delivery until the fall, in part, so it can release beta versions of OS/2 for PowerPC simultaneously with the system.

Right on Tatung's heels are six other Taiwan-based hardware manufacturers, which also used Computex to show off early versions of similar Prep-compliant desktop systems.

But it is Tatung's commitment as the largest Taiwanese electronics firm that may influence many more Pacific Rim companies to follow suit.

"Tatung is the oldest electronics company and is pretty conservative. But they like what they see [in the PowerPC technology] to where they want to be first to market," said Phil Pompa, Motorola's vice president of marketing.

Indeed, Tatung is one of the first members of the newly organized Taiwan New PC Consortium, which was formed by the Computer and Communications Research Laboratories — a government-sponsored agency designed to spur growth of the emerging computer marketplace in Taiwan — and the Taiwan Electronic Appliance Manufacturer's Association.

Pro PowerPC

The new organization is intended to serve as a focal point that combines the resources of Motorola, IBM and more than 30 Taiwanese companies that will jointly develop and promote PowerPC-based systems and technologies.

Getting a wide variety of systems makers to back the Prep standard, which allows a variety of different operating systems and their applications to run compatibly, is crucial if PowerPC supporters hope to loosen Intel Corp.'s iron grip on the microprocessor market, many observers said.

"We are not just looking for systems makers but [independent software vendors], add-in cardmakers and chip set designers," Pompa said of the new group.

IBM and Motorola's RISC Microprocessor Division will also open a PowerPC technical center in Taipei to help hardware and software suppliers and create PowerPC-compatible systems and subsystems. This facility will be the first of several such centers scheduled to open around the world before year's end, a Motorola spokesman said.

Called TPC-5510, the Tatung systems will be powered by 66- and 80-MHz versions of the PowerPC 601 processor. In addition to Microsoft Corp.'s Windows NT, the systems are expected to run a variety of 32-bit operating systems, including versions of IBM's OS/2 and AIX and SunSoft, Inc.'s Solaris.

Tatung is also developing systems centered on the PowerPC 603 and 604. Those systems are not expected to be available until next year.

Digital storage division top spin-off candidate

By Mary Brandel

It is easy to overlook the bright spots at Digital Equipment Corp. as it struggles through some of its darker days. But with a 40% growth rate and $1.5 billion in revenue, the company's storage unit is widely viewed as one of Digital's bigger successes.

While the rest of Digital has been downsizing, the storage unit hired 100 people a week at its Colorado manufacturing facility in January.

The storage unit's promising outlook, in fact, has fueled speculation that it is a prime candidate for a sale or spin-off. Rumors on that topic have swirled ever since Chief Executive Officer Robert Palmer promised last month that he would decide what parts of the troubled company to sell by June.

"If storage became an autonomous division, it could find new ways to compete with storage vendors."
—Richard Buchanan, Forrester Research, Inc.

The storage unit's star is its OEM disk drive business, which has the highest revenue growth and accounts for 55% of the overall storage business. Manufacturing production has doubled every quarter for the last five to six quarters, Digital said, and the unit has signed Dell Computer Corp. and Compaq Computer Corp. as two of its biggest clients. Today, two-thirds of this unit's business is with independent OEMs.

The storage area was also the first business unit to become relatively autonomous from the rest of Digital's bureaucracy more than three years ago. "This is one of the most easily separable units of the company," said Charlie Christ, vice president of the storage business unit.

Christ also noted that the unit has its own profit/loss responsibility and is the only one with a dedicated manufacturing facility. It uses Digital's sales force for installed-base sales but has its own for the OEM drive business. "We've been successful, so we're a candidate of choice when people speculate what might happen," he noted.

Spin-off options

Some observers said a likely scenario is that the storage unit will be made a fully autonomous division. "There's a lot of support within the company for something like that to happen in both storage and PCs, and at least another unit," Christ said, referring to the newly formed Network Product Business unit under Larry Walker, vice president and general manager. "It's highly probable that's the direction we'll move in."

Some questioned whether the unit could stand on its own, however. "The company has some discretion as to how it allocates" research and development, said William Milton, an analyst at Brown Brothers Harriman & Co. in New York. He added that if the storage business reported its financial results independently of Digital, he doubted it would be profitable. Digital denied this.

Others said the unit could thrive even more if it lost its identity as a rival systems vendor and ramped up sales to Digital competitors. Today, the storage unit depends on Digital for half its revenue, Christ said.

"Could they go head-to-head with the best of the world? I think they could," said Richard Buchanan, an analyst at Forrester Research, Inc. in Cambridge, Mass.

Joined at the hip

Digital's storage unit is divided into four units that supply components to one another:

- The heads group sells to OEMs and Digital's own disk drive business.
- The disk drive/tape group sells to OEMs and to Digital's systems and subsystems business.
- The subsystems group takes the drives and packages them into its StorageWorks architecture.
- The video server group incorporates StorageWorks into the systems it sells to regional phone and cable companies.

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Editorial

Step into the '90s

Dwight D. Eisenhower was elected to his second term as president. The American flag had 48 stars. There were fewer than 1,000 Japanese import cars sold in the U.S. And Rocky Marciano was boxing's world heavyweight champ.

Yes, things were quite different in 1956. Baek then, eomputer companies — sueh as they were — sold hardware and almost nothing else. IBM's big breadwinner was the keypuneh machinc. IBM dominated the industry, really and truly dominated.

So the federal government saw fit to eneourage growth in the flourishing information processing business by forcing IBM to set up separate leasing and service companies that had to aet at arm's length from the rest of the eompany — a ruling that ultimately gave birth to the third-party software industry, the leasing industry and essentially to the $400 billion worldwide market we know today.

The wisdom then was simple and righteous. The feds would apply the same logie to the communieations industry 25 years later in breaking up AT&T, yielding a subindustry that has been a boon to users.

Now IBM will seek a release from the confines of that elearly anaehronistie 1956 consent decree, whieh has hampered its ability to compete effeetively in the booming services market.

And why not? The industry today bears almost no resemblance to what it was 40 years ago. Today, major vendors build their fortunes not by selling hardware but by selling integration and support serviees.

In other words, there is a riehly diverse and vibrant serviees market with players of all sizes. The thought of IBM dominating the serviee market by leveraging its hardware sales strength — as some contend — is not founded in any reality other than the economic interest of companies not wishing to deal on a level playing field with a big eompetitor.

Of eourse, some sort of painstaking examination of all the facts needs be undertaken by U.S. Justice Department lawyers. This examination may well find that IBM has violated the spirit, if not the letter of the consent decree, in its eomputer leasing and services business, both of which are substantial.

If that is the case, all the more reason to remove these restrictions because the service providers have thrived anyway, and IBM has also grown in this market. As for computer lessors, their business has always been one of peaks and valleys. But eertainly the dire predictions of universal lessor bankruptey predicted by so many lessors when IBM formed its own leasing company have not eome to pass.

If the federal government is to have any role in the economy, it should be one that promotes competition because the consumer benefits are so apparent. Ike is dead; so is Rocky. It's time to bury the deeree as well.

Bill Laberis

Bill Laberis, *Editor in Chief*
Internet: *blaberis@cw.com*

Letters to the editor

Licensing=bias

"Industry debates eertifiea-tion" [CW, May 2] raises some serious questions. The sidebar lists proposed requirements, among them a four-year eollege degree to aequire "best praetiees," whieh implies a eomputer seienee degree. This ereates age bias, as there was no such eurrieulum for my bachelor's or master's degree.

An apprentice system would limit the ability of workers to change jobs, and small shops may not have more than one or two teehnieal people. As for the proposed sanetions, who would impose them? Big Brother is watching you.

Tests are subject to cultural bias; even eollege boards stand aeeused of ereating exams that diseriminate. For safety-eritieal applications, a voluntary program for licensing of persons who test or supervise makes sense. For the other 95% of programmers, lieensing represents only bias and barriers.

Al Smith
Highland Park, N.J.

JAD isn't bad

Regarding "Why JAD goes bad" [CW, April 25], I would like to correct some points about Entex and the client/server system we developed with Andersen Consulting.

First, we are not Entex, Inc.; we are Entex, a division of Arkla, Inc. Second, when Mike Van Hoozer and I at Andersen Consulting were interviewed for this article, we stated that we felt the most important reason for our success in this effort was the value that our organizations place on teamwork.

Certainly, the *informal* joint applieation development sessions with the project team and the end users were required to develop a functional system that supports an important business need. But most important to the sueeessful introduction of new teehnologies and applieation development methods are well-understood objectives for the projeet that are aeeepted by those involved. Our IS projeet team and the Andersen Consulting team had well-stated objeetives, and our end users were very supportive and patient.

Finally, the system that was delivered does not allow our natural gas utility customers to make payments into the system themselves. The Entex Cashier System allows our cashiers to operate a eash drawer workstation that interaets with a legaey mainframe-based Customer Information System to better serve our eustomers.

We appreciate *Computerworld*'s interest in our projeet. We are very proud that our first endeavor into the eomplex new world of elient/server eomputing can be reported as a suceessful one.

David Gammell
Houston

In "Why JAD goes bad," the writer either misunderstood what I said or missed my point.

I stated that rapid application development (not JAD) may not be appropriate for the construction of very large, eore mission-eritieal systems. A number of prerequisites — ineluding user availability and cooperation, eomplexity of business rules and the time required to produee the first working prototype — must fit the methodology for it to be usable.

When my eompany tried to use RAD for a new order-entry system, we needed a group of users to partieipate several hours a day in the RAD sessions. But the users (salespeople) we needed didn't want what we were developing, and the time they spent with us was time they weren't selling, which took money from them.

The business rules to be coded into the application were imprecise and were being addressed by affected managers as they had time to do so, not according to our development schedule. And even if we had had perfect cooperation, we were developing an application that we eouldn't break up into manageable pieees aeeording to the RAD methodology beeause order entry in this eompany is monolithie, with eomplex business rules governing eaeh aspeet of the proeess. We eould find no useful "order-entry" subset to build in a RAD time box.

James L. Gillaspy
Atlanta

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Vision goes full cycle

E. Ted Prince

Remember when it was cool to be a visionary? You dreamed up a vision and an ensemble comprising an enterprise model, a logical data architecture and a dash of avant-garde technology just for good measure. And you topped it off with socially conscious objectives, as well as a responsible corporate staff.

Times have changed. If the head of IBM can assert that he cares naught about vision, then we followers must surely follow. Now its macho time: Can I fire more people than my competition? If I don't, then I'm a wimp, or I'm history, as the hapless head of IBM human resources found out recently when it was job-cutting time. Return on investment (ROI), cost-cutting and lean and mean have become the the American corporation's order of the day. Enterprise models and visions don't work anyway. If they do, why did we have a recession?

As a sop to the old top-down Bolsheviks, we invented bottom-up visions. So now its fashionable to go in through the micro side with BPR (business process re-engineering to the techno-yuppies). See, you don't have to be macro to be able to plan, right?

But guess what? BPR probably works just as well as the old enterprise models and architectures, i.e. badly. If it's that good, why do we still need to keep using the IF (iterative firings) model? Are we missing something in both the top-down and bottom-up approaches?

Return on investment, cost-cutting and lean and mean have become the order of the day.

The problem with these approaches is that they are static — at best, poor and misleading representations of organizational and business dynamics. They are the philosophical outgrowths of a mainframe-centric world, providing a stable, powerful but monolithic and inflexible organization model.

BPR and enterprise models don't take into account inconvenient facts such as people. They don't allow for clients with intelligence who answer you back. Prince's Fourth Law of MIS states that as gross data processing growth exceeds 5%, ROI and IF approaches are displaced by vision approaches, and bottom-up gives way to top-down again. The detailed protocols for this law, however, also indicate that this occurs only when a new enabling technology comes along, cleaning up the messes created by the last lot. Detailed calculations clearly show that the conditions for this change are just about upon us.

Closet visionaries take heart. Macho firings will fade. Times are improving, and vision will return. This time it will have a new set of buzzwords and concepts that will keep us fascinated until the next recession comes in 199(?).

Prince is president of Perth Ventures, Inc., a technology publishing and mergers and acquisitions firm in Hawley, Pa. He can be reached by CompuServe at 74073,1236.

First, let's hire all the lawyers

Esther Dyson

Why is law like software? It's a complex system for representing and coding concrete systems that implement high-level goals and actions that may not be stated explicitly. For example: "The customer should receive a bill" reflects a higher level goal of getting paid. Similarly, "In the event of the third party's demise" reflects a goal about distribution of assets. In either case, the process of turning goals into concrete code or contracts is the province of experts.

Turning the abstractions into code — or programming — began as something only human experts could do. But eventually, people realized that software coding is a fairly low-level job and one that can be automated: clever programmers developed tools to turn specifications and requirements into code. Now analysts are in scarce supply, but coding is mostly automatic.

Most of our lawyers are the equivalent of analysts who waste too much time coding software.

The law too may someday go through the transitions that software programming has undergone. We're a long way away from that in the legal profession. There are boilerplate documents, to be sure, but nothing that I would call object-oriented document generation, where you assemble a legal document of interacting sections based on the specifications for a lawsuit or a contract. (If you have such a product, please call me!) But most of our lawyers are the equivalent of analysts who waste too much time coding.

I suspect the reason is that techno-people could see the potential for this in the software world, but lawyers and programmers are worlds apart. Yet object-oriented law could be a real boost to productivity, assuming we need lawyers and lawsuits in the first place. The issues are the same — design rules, constraints, a focus on results and objectives rather than implementation details. As with system design, it's not simply filling in parameters on a template but a more creative construction process.

Of course, the place where programming and law meet is computer law, so it's no coincidence that some of the first steps are being taken by a company called SmartPatents, Inc. in Menlo Park, Calif., which specializes in electronic patent management systems. SmartPatents doesn't yet construct lawsuits or patents, but it does apply software to the horrendous documents that are filed with the patent office. SmartPatents' WorkBench software lets you examine a patent text search, highlight it, annotate it, jump from text references to numbered areas in the diagram that, by law, must accompany each patent, and the like.

This doesn't really solve the problem of examining a patent but is similar to early source code editing tools; they let you see what you have. SmartPatents also goes to the trouble of "preparing" the patents in the proper format for viewing. The patents, of course, are public domain, but in their SmartPatents form they sell quickly — thousands sold at about $100 each since January — to an audience of lawyers and corporate intellectual property managers.

The technology behind SmartPatents (patented, of course) didn't strike me as extraordinary, although the company's understanding of its market did. It was founded last year by two patent lawyers, Irving Rappaport, formerly associate general counsel for Apple, and Kevin Rivette, formerly president of a telecommunications software company. The product is produced for lawyers by lawyers.

In many ways, it's a model for the software that will be successful in the future. But like computer-aided software engineering packages, SmartPatents is more than just a product for customers: It's the foundation of the industry. As the technology business becomes the intellectual property business, intellectual property experts will be the focus — as providers, customers and designers of the world we live in. Like it or not.

Dyson is president of Edventure Holdings, Inc. in New York. She welcomes readers' thoughts and can be reached on the Internet at edyson@eff.org.

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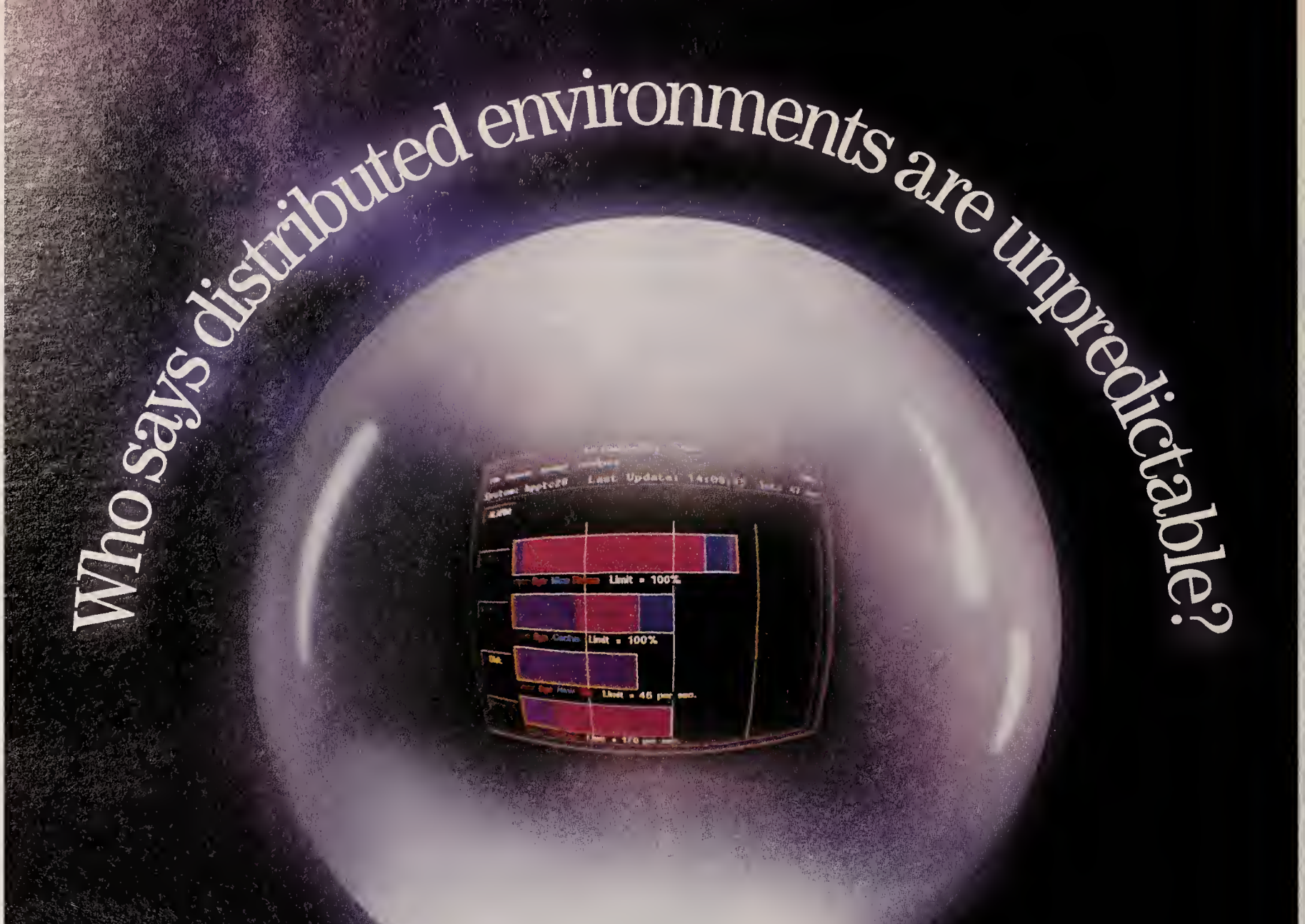

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Chicago may stall NT sales

Newer release to include graphical capabilities slated for Daytona

By Stuart J. Johnston and Ed Scannell
REDMOND, WASH.

Microsoft Corp. has begun telling developers and customers about a second release of Chicago scheduled for 1995 or 1996, which will include the three-dimensional graphics libraries also slated to be in the Windows NT Version 3.5, code-named Daytona.

Chicago, or Windows 4.0, *has a more object-oriented user interface than that found in Daytona, which still has the Windows 3.1 interface*

The OpenGL graphics libraries from Silicon Graphics, Inc. are a big selling point for using Daytona, which is due out this summer as a workstation system. Including the libraries in Chicago, even though Chicago may be a year away, Daytona is likely to stall Windows NT sales, analysts predicted.

Chicago — the next major version of desktop Windows, which Microsoft has promised by year's end — sports a more object-oriented user interface than that found in Daytona, which still has the Windows 3.1 interface.

Adding OpenGL support to Chicago may help users move freely between Windows and Windows NT, as well as between those operating systems and Unix workstations.

Which will it be?

But it also muddies the water for users who have to choose between Windows and NT.

OpenGL was originally added to Daytona — now in beta testing and scheduled for a third-quarter delivery — as a major selling point for users who want to run high-

Chicago, *page 69*

Desktop mapping prices dropping to reach mainstream

By Mitch Betts

The cost of entry-level desktop mapping — including the census data — has just fallen below $2,000.

Environmental Systems Research, Inc. and Wessex, Inc. last week jointly unveiled an entry-level package that bundles Environmental Systems' ArcView Version 2 mapping software with 22 CD-ROMs of U.S. census data from Wessex.

The price of the bundle, called First St., is $1,995. A Wessex spokesman said buying comparable software and 1990 census data from other suppliers would typically cost between $30,000 and $100,000.

Expandinging market

The move is an effort to broaden the traditional market for geographic information systems (GIS) to reach mainstream business analysts, such as those in sales and marketing functions, said James Rapinac, an analyst at Daratech, Inc., a Cambridge, Mass.-based market researcher.

Other GIS vendors are driving at the same goal with somewhat different approaches. Strategic Mapping, Inc., for example, is working to embed elementary mapping functions in mainstream PC packages such as Lotus Development

Desktop mapping, *page 46*

Updated Mosaic said to ease Internet access

By Ellis Booker
CHICAGO

As any brave soul who has cruised the Internet will tell you, this vast sea of information, news and trivia is often maddeningly difficult to navigate.

Enter Mosaic, the most popular of a number of graphical front-end tools for accessing resources on the Internet.

Point and click

Developed by the National Center for Supercomputing Applications (NCSA) at the University of Illinois at Urbana-Champaign, Mosaic offers point-and-click access to the World Wide Web (WWW), a subset of some 2,300 Internet servers that feature hyperlinked multimedia documents. The WWW is the fastest-growing Internet information service.

This portion of a World Wide Web *document from the Internet Shopping Network illustrates both the use of interactive prompts or buttons and hyperlinked text that can be moved from page to page or server to server*

"Mosaic is a single-client program that can talk with and present the resources without having you switch to different types of server programs," said Daniel P. Dern, an Internet expert in Newton Center, Mass., and author of *The Internet Guide for New Users*.

"It's not the universal remote for the Internet, but it's close," he said.

Mosaic is free for the taking from numerous WWW servers. NCSA estimates there are more than a million Mosaic users to date; more than 30,000 copies of the front end are downloaded each month. But, as Dern noted, the tool was never "productized" by NCSA.

The main goal

Making Mosaic the sort of shrink-wrapped item that computer and software companies will feel comfortable bundling into their products is the goal of Spyglass, Inc. in Savoy, Ill.

Earlier this month at the Internet World show in San Jose, Calif., Spyglass and NCSA announced an agreement whereby Spyglass will develop a "commercially enhanced" version of Mosaic. NCSA will continue to maintain a public-with-copyright version of Mosaic.

Digital Equipment Corp. simultaneously announced that it will bundle the Spyglass Mosaic with all its computer systems. Digital is believed to be the first computer maker to do this, although Spyglass confirms it is talking with other OEMs.

According to a Spyglass spokeswoman, the development effort will yield a cleaner code that uses less memory and looks consistent across different operating systems. The current Mosaic is available on X Window System/Unix, Windows, Macintosh and Amiga.

The good points

"It'll also be easier to install and have on-line hypertext-based help and on-line documentation for creating a World Wide Web server," the spokeswoman said. Another enhancement will be forms support so that an order-entry form for a WWW server, for example, can be filled out by a customer from a Mosaic-attached workstation.

Mosaic from Spyglass will be available for Windows and Macintosh platforms this month and for X Window computers next month.

Running Mosaic

Mosaic is a client or browsing tool for multimedia documents created and stored on the World Wide Web. It is available for X Window/Unix, Windows, Macintosh and Amiga.

Unfortunately, to get the real feel for real-time networked multimedia via Mosaic, a TCP/IP connection to the Internet of at least 56K bit/sec. is recommended.

—Ellis Booker

PDAs face skeptical corporate reception

By Michael Fitzgerald

In the wake of Apple Computer, Inc.'s recent shakeups in its Newton division and Compaq Computer Corp.'s decision to delay indefinitely its handheld Mobile Companion, "to be or not to be" looks like the question of the moment for personal digital assistants (PDA).

"The fundamental question is, 'Why should people use PDAs?' " said Barton Goldenberg, president of Information Systems Marketing, Inc., a consultancy in Washington. Interviews with users and a recent survey of 500 executives indicate that users see little reason to use PDAs, at least for now.

One of the original selling points of the PDA was that people could use them anywhere to send queries that would be answered in real time. The idea of scribbling notes onto a PDA like some kind of appointment book made it seem to be a general-purpose tool for a broad market. Instead, the lack of a solid wireless communications infrastructure and related shortcomings in the first generation of PDAs has soured many to its uses.

The cold shoulder

For instance, top executives were expected to take to PDAs like otters to water. But Goldenberg said his company surveyed 500 executives and found that 80% do not expect to use a PDA as a general-purpose tool, despite its purported ubiquity. Goldenberg said this does not mean that the PDA has no reason to exist, just that vendors and users should focus their expectations on vertical markets in the near term.

Utilities, package mail deliverers, law enforcement officials, field technicians and other forms-oriented, mobile professionals are among the major vertical markets targeted now by companies like Apple. But corporate users contacted were largely skeptical of the PDA.

Baxter Healthcare Corp. in Deerfield, Ill., has put a once-promising PDA project on the back burner. The project's goal was to put PDAs in the hands of health care professionals to help automate patient care.

"We had expectations initially, and then we were disappointed," said Glenn Jurmann, section manager of office technology at Baxter. Jurmann said Baxter is unlikely to consider PDAs again until the technology is proved useful.

The problems Baxter found with PDAs include the following:

- Insufficient processing power: Most chips used in PDAs fall below the Intel Corp. I486 class.
- Limited or nonexistent handwriting recognition.
- A lack of "anytime/anywhere" communications — an impossible goal to meet within the current communications infrastructure.

These shortcomings were echoed by other information systems executives leery of PDAs.

Victor Mutnick, corporate vice president at New York Life Insurance Co., said he thinks PDAs have a future, but "we'll let somebody else get burned before we jump on the bandwagon."

Mutnick said he saw the PDA as a sort of supersmart phone and that by working through better wireless communications networks than exist today, "I can get information wherever I am, but it fits in my briefcase."

Like Mutnick, some IS managers see PDAs as very advanced cellular phones, a direction some observers think the industry must take before PDAs will catch on [CW, Feb. 28].

Sheldon Laube, the normally technofriendly national director of information technology at Price Waterhouse, said he doubts that even solving these issues will lead many companies to require their users to have PDAs.

"We say to our professionals, 'You have to have your portable computer,' and most of them would need more than a PDA," Laube said. He said he would probably use a PDA if the communications infrastructure were in place but sees their current usefulness limited to "when you have to take a quick note."

Still, most executives think the PDA will survive, and some see it becoming an important part of the corporate computing structure.

"Whether it's Newton or daughter of Newton, there's no question in my mind that there's a need [for PDAs]," said Edward N. Altman, vice president of management information services at Metro-Goldwyn-Mayer, Inc.

Altman said executives in the entertainment industry could use a device that can scan a corporate database from a remote site and pull down information on movies an actor has appeared in or credits a director has. He is already building databases at MGM that are oriented toward easy on-line access.

But PDA projects in general are moving slowly. Apple, for one, has shifted its Newton sales focus into vertical niches, a tack most analysts think is appropriate until the products cost less than $500.

"Verticals are where it makes sense," said Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass. "It's a real interesting possibility to do volume rollouts to particular occupational groups or industries. [No other users] are going to continue pumping money into development projects that are controversial or not going to pay off."

Helping the farmers

PDA projects that are under way are still largely nascent.

For example, Monsanto Corp.'s Infielder project created a software tool running on a Newton for farmers to use in the field. Monsanto recently spun off the group into a separate company, Hagbee, Inc., which is now beta testing Infielder.

The Institute's Harold Reetz: *Farmers can use Newton to keep computerized data*

Harold Reetz, who as Midwest director of the Potash and Phosphate Institute is coordinating a 35-person beta test, said farmers can use Newton to keep computerized data on crops, soil conditions and fertilizer mixes with them at all times, as well as to take notes. The test is only a month old, and because it is planting season, few of the farmers have spent much time with Newton.

Reetz said those farmers who have had a chance to try it, however, "like what they see. When you get the data in the system, you can generate reports to take to the banker, landlord or whatever to summarize what's going on at the farm."

—Michael Fitzgerald

Rasterops offers integrated video card

By Jaikumar Vijayan and Michael Fitzgerald

Rasterops Corp. plans to announce next week an integrated video playback card with accelerated graphics support for Windows users. The Rasterops cards will enable full-motion, full-screen video and CD-quality audio playback.

The new Rasterops Impact card will support all standard buses and conforms to the Motion Pictures Experts Group (MPEG) video compression standards. The card, which is expected to ship in the third quarter, will have an expected retail price of under $500.

Users and analysts are excited about the potential of the new card in the Windows environment.

"People expect TV-size images and quality, and what we've seen so far in [Apple Computer, Inc.'s] QuickTime and [Microsoft Corp.'s] Video for Windows is it's kind of a kiddie toy," said Brian Moura, assistant city manager for the city of San Carlos, Calif.

Analysts welcomed the proposed announcement of a Windows-based graphics card from Rasterops and predicted that it would enhance graphics standards in the PC industry.

Ahead of the game

"They have a head start on this stuff. Compression cards are new in the PC, [so] Rasterops brings experience into the market," said Martin Reynolds, an analyst at Computer Intelligence/InfoCorp in Santa Clara, Calif.

MPEG compression on the card will enable users to distribute sophisticated video onto CD-ROM for applications such as interactive training videos in a corporate environment, Reynolds said.

Enhanced video imaging capabilities that will let users splice video images with computer-generated ones will drive the technology into the home market, according to Reynolds.

Rasterops also plans to announce two other low-cost accelerated graphics cards in the Windows environment.

The Pinnacle and Pinnacle Pro graphics cards will support multiple bus configurations and 24-bit color up to 1,024- by 768-pixel resolution. The cards are expected to retail starting at $139. The chips are slated to start shipping next month.

Desktop mapping prices

CONTINUED FROM PAGE 45

Corp.'s spreadsheet [CW, June 6].

The backers of First St. hope those spreadsheet utilities will whet user appetites for more GIS functionality and more data, leading them to upgrade to First St., Rapinac said.

Environmental Systems, based in Redlands, Calif., is the market leader in desktop mapping software, while Wessex, based in Winnetka, Ill., supplies databases for mapping applications.

First St. provides several common business applications, such as site selection and sales territory analysis, as preprogrammed "buttons." The ArcView engine also allows users to geocode their internal customer data — that is, to assign an address to a spot on the map — for market analysis, the vendors said.

In the future, the product can be enhanced to add fresher data, more generic applications for the casual user and vertical-industry applications such as insurance risk analysis and delivery routing, said Scott Elliott, president of Wessex.

Elliott estimated that First St. will attract more than 3 million new users to the business mapping market in the next three years.

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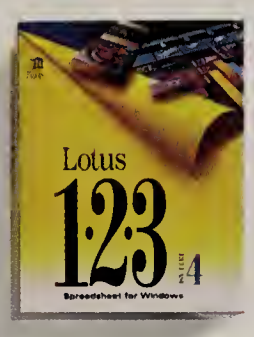

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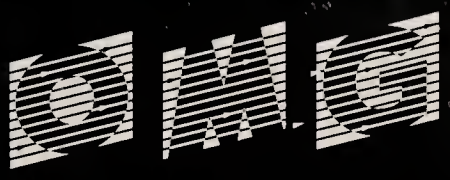

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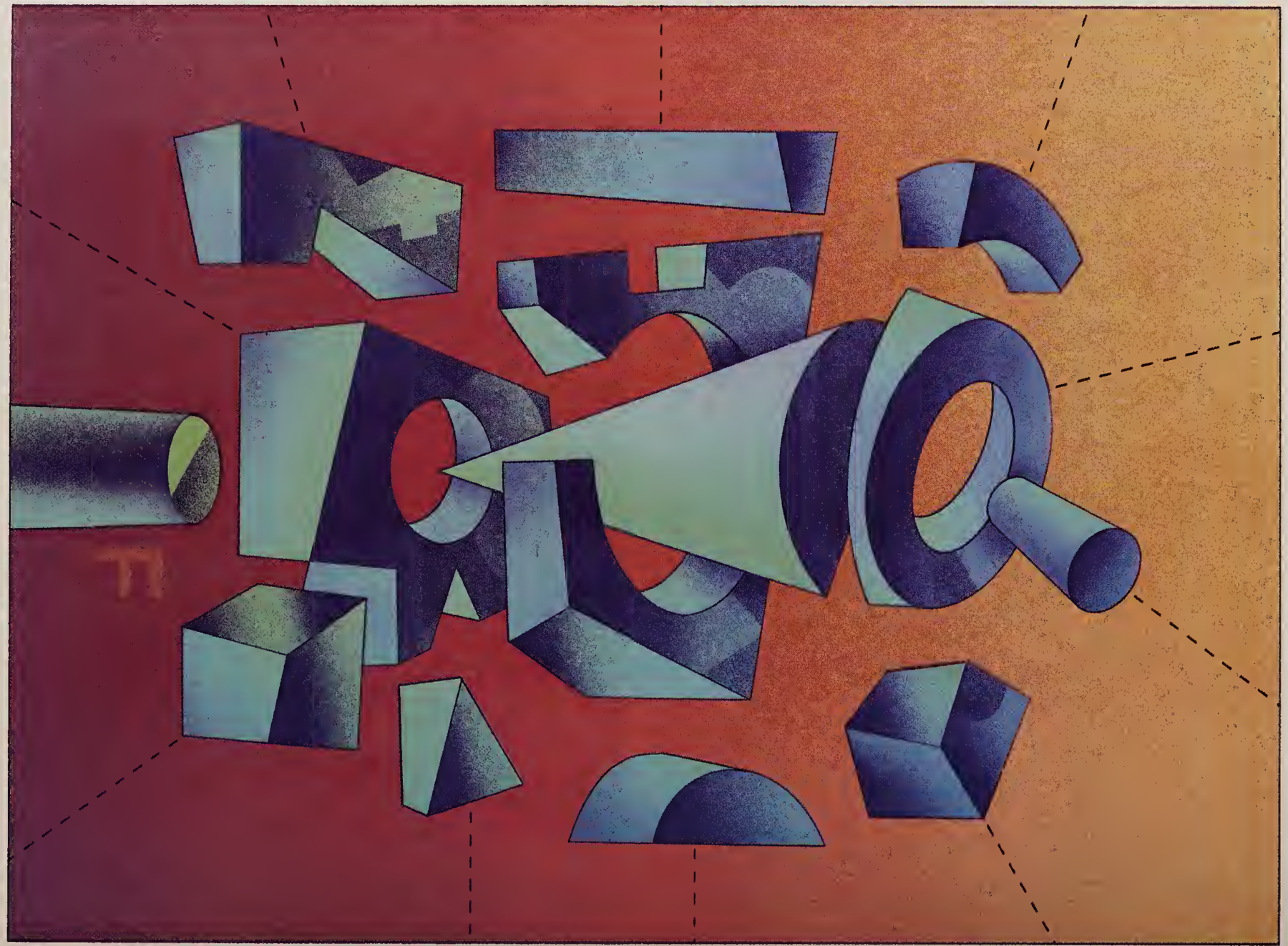

introduction

Today's business environment is demanding a completely new level of integration between new computer technologies and installed systems, the legacy of past computing successes. As a result, Information Technology (IT) departments are being driven to remake themselves into smaller, leaner organizations that provide "open information services" and support for a multitude of small distributed systems.

Monolithic mainframes, sequestered in glass houses, are rapidly becoming a historical oddity as PCs, servers and workstations are networked together. These new distributed systems provide the CPU power necessary to process and analyze data from many sources demanded by information-driven organizations searching for a competitive edge.

Rather than providing reams of green-bar reports, IT professionals are asked to support faster business practices by engineering new systems that integrate many different types of company information in real time. The days of evaluating programmers by lines of code rather than by the delivery of usable function are disappearing.

This mission is without equal in the short, but tumultuous, history of MIS, and must be undertaken with frozen or very limited budgets. Moreover, integration and the extension of existing systems must be accomplished without downgrading current service.

Each day more companies succumb to the pressures of competition and begin integrating new methodologies and technologies into their already strained departments. All this is done in an attempt to provide more pervasive, open and distributed information that can be used to make better business decisions.

This white paper is an exploration of the current use of object technology (OT) and its ability to solve business problems in a wide range of companies. Some of these trailblazing companies are using OT as a new approach to building systems, while others are integrating new and old systems into the business-decision-making processes of their companies.

In either case, this White Paper examines those companies via a series of "snapshots" focusing on the efforts of thoughtful IT professionals who are applying OT to problems that are unyielding or unapproachable through a traditional development technique. No final conclusions are possible as these profiled projects were conceived and implemented as processes that would change as they confronted a dynamic business environment.

It is important to note that, to a person, the IT professionals interviewed for this article stress the business needs that drive their technology decisions rather then their intrigue with a particular technical approach.

The movement toward wide-scale adoption of OT in support of a more integrated approach to computing is well underway. While final results are not yet available, a clear and unambiguous picture is emerging. Properly staffed, planned and implemented OT-based projects are demonstrating superior results to traditionally planned and implemented systems in terms of flexibility, user satisfaction and costs.

The goal of this White Paper is not to applaud the few brave pioneers who have risked all to gamble their careers on a roll of the technology dice, but rather to acknowledge the prudent, hardheaded IT professionals that are increasingly investing time, energy and resources in OT-based solutions because these solutions are the best, safest, and in some cases, the only answers to their information system needs.

OMG was founded in 1989 to promote the theory and practice of object technology for development of distributed computing systems. The goal is to provide a common architectural framework for object-oriented applications based on widely-available interface specifications. OMG believes that wide-scale industry adoption of the Object Management Architecture (OMA) and its supporting interface specifications, such as the Common Object Request Broker Architecture (CORBA), will provide product developers and technology users alike with the means to build heterogeneous software systems distributed across all major hardware, operating systems and language environments. OMG is headquartered in Framingham, Mass., and has a western office in Boulder, Colo., as well as international marketing offices in the UK, Germany and Japan. Membership includes over 390 software vendors, software developers and end users. For a list of OMG publications or additional information, please call 508-820-4300; fax, 508-820-4303; or E-mail, info@omg.org.

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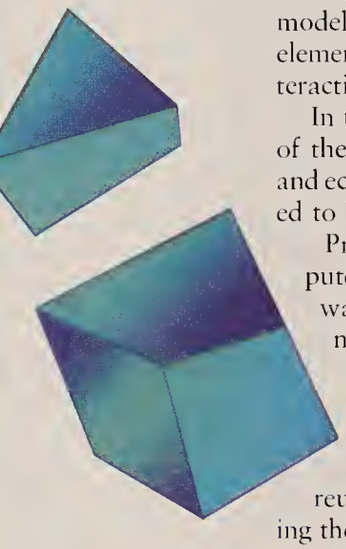
This White Paper was written by John Slitz, Vice President of Marketing, the Object Management Group.

Written Independently of Computerworld

DEFINING OBJECT TECHNOLOGY

Object Technology has been around since its invention in 1969 by Dr. Kristin Nygaard of Norway. At the time, Dr. Nygaard was trying to model a Norwegian fjord and the movement of the ships passing through it. The combination of ship movements, tides, waves and the irregular coast line made the problem extremely difficult until he hit upon the idea of first modeling each component as a single, autonomous element, and then modeling the relationships or interactions between these elements.



In this way, he could address the dynamic nature of the problem in a way that allowed for a flexible and economical approach to the amount of code needed to be produced.

Prior to 1969, and continuing through today, computer programs separated procedures — what you want to do — from data — what the procedures need to operate upon. This was the most efficient approach because a programmer could then reuse the data by applying many different procedures.

Object technology retains the efficiency of reuse but reverses the former process by combining the data and procedures into a single entity called an object. Once created, the object can continue to exist, meaning it has persistence, thus making it easier to find, change and reuse in other applications.

An object is any piece of software that can reasonably support the concept of a name. A more formal definition would address the need for procedures — sometimes called methods — to be resident with some form of data. Back in 1969, Dr. Nygaard's objects were mathematical models of the boats and other physical aspects of the fjord being analyzed. Like their real-world counterparts, computer objects both exist and are subject to "behavior," e.g., boats float, sink, move, etc.

Once created, the object can continue to exist, meaning it has persistence, thus making it easier to find, change and reuse in other applications.

Also like their real-world namesakes, software objects may be either large or small: A grain of sand and the Earth are two objects quite different in size and complexity, yet they are both objects. That means getting the size, or granularity, of objects right for the task at hand is very important when designing or implementing object-based systems.

It is very helpful to think of systems being composed of objects that have behaviors, support interactions and have relationships, rather than viewing them as procedures operating upon some data. As a result, it is possible to more easily model real-world objects to duplicate their behavior and characteristics.

If shown levitating several feet out of the water, a boat object in Dr. Nygaard's original model would lead even a computer-illiterate person to conclude that the model was not quite right, whether or not the person understood the computer technology behind the simulation. As systems being built to support commercial applications become ever more complex, this ability to refer to real-world objects for sanity checks becomes increasingly important.

Objects also have attributes and methods. This means that they have within themselves a certain number of characteristics, including, for example, color and hardness. They are also capable of actions, such as floating or sinking in the case of boats. Once an object is created it exists in relationship to other objects. Objects are arranged hierarchically in classes by their dominant characteristics. The class "boat" could include sailboats, row boats, canoes and other types. Each type might have further subclasses, e.g., powered, sailed, rowed and so on.

INHERITANCE

Two other widely discussed aspects of OT are the notions of inheritance and polymorphism. Inheritance can be thought of as a technical "ditto-plus" function. For example, object "sailboat" is exactly like object "boat" with the addition of it being powered by a sail; all other attributes are the same. A programmer can simply note one object as inheriting all of the characteristics of another plus some special feature, without having to duplicate all of the code in each object.

Inheritance is a benefit for programmers because it reduces the amount of code that goes toward duplicating what went before. This reduces errors and may result in faster operations.

POLYMORPHISM

Polymorphism allows an instruction to be given to an object in the form of a generalized, rather than a specific, detailed command. If the command given were "move," the object will know that movement is one of its behaviors and how specifically it may move. The simple "move" command would be translated differently by the captain of a sailboat, a rower in a racing shell and the pilot of a tug. Yet, while their specific actions, which are internal to their objects, would be different, the results would all be the same: Their boats would move.

REUSE

Reuse is another important concept. Unfortunately, computer programming, unlike most human endeavors since the mid 1700s, has remained relatively unaffected by the concept of standardized, interchangeable parts. Programmers continue to be rated on the lines of code they generate each day, not the number of programs completed, or the flexibility of future modification their programs exhibit.

A key part of OT's attraction is that once an ob-

ject is created, tested and found useful, it can be cloned and used repeatedly. This has the potential to save software developers untold time, because it saves them from reinventing the wheel.

Reuse also allows mistakes to be substantially reduced, as the construction of an application from pretested, reused parts lessens the possibility of errors in the parts and relegates testing to the design and assembly of the correct objects. However, to attain meaningful levels of reuse, a strict design and architectural approach to building and assembling objects must be established.

After all, on Henry Ford's assembly line an exact specification for each part of the Tin Lizzy was produced, and then each part was given tolerances and shown in its connection to all the other parts that together constituted the Model T. Just as producing parts was not good enough for Henry Ford in the 1920s, it is also not enough now for software assemblies based on OT. The key is understanding that the scope of the problem extends into the design and architecture of systems and not just the production of objects.

INCREASED COMPLEXITY

Increasing expectations for functionality, flexibility, ease of use, integration, multivendor systems and networking have driven software projects to become larger. This results in longer development times, more costly maintenance and the general challenge of having any one program work well not only in isolation, but also in an integrated environment with another program, which was most likely developed by some other company.

Modern business demands more information. This requires raw data to be accumulated, analyzed, turned into information and then communicated to someone who can use it in real time. When increased project size is added to this need for more information, the situation quickly spins out of control. Most mid-to-large sized companies have hundreds of different computer systems running thousands of programs, supporting millions of business decisions every day.

If Dr. Nygaard had problems with his boats and waves 25 years ago, consider the plight of Dr. Robert Cromp of NASA. Dr. Cromp has been struggling with the problem of how to capture and analyze the terrabytes of data beamed down to earth daily from orbiting satellites. Just collecting and cataloguing this quantity of data produces hundreds of tables in a relational database that can only be accessed through SQL queries. A simple question like "How much has plate #987 moved?" would require several pages of SQL instructions, an experienced computer operator to help the scientist make the query and interpret the answer, and a supercomputer to process the data. This situation is a good example of a complex process being made worse by the shortcomings of modern computer science.

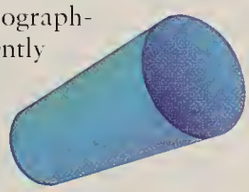
Another aspect of the NASA problem is the way in which the raw data must be assigned to tables in order to be processed. This process inherently requires a degree of rationalization and some predisposition toward the ultimate use of the data. This is difficult because the scientist may not know ahead of time what analysis to run on the data.

This lack of knowledge severely limits the usefulness of the system, as the scientists must modify their questions in order to fit within the SQL syntax. Also, the answer may be unintentionally biased by the way in which the data had been assigned to tables when initially collected.

In order to cope with his dilemma, Dr. Cromp has instituted an OT approach that uses an object base to store the data as objects rather then trying to disassemble it into tables. This has allowed NASA easier access to the data once it is collected and stored. It also makes both data storage and retrieval easier than under a traditional system.

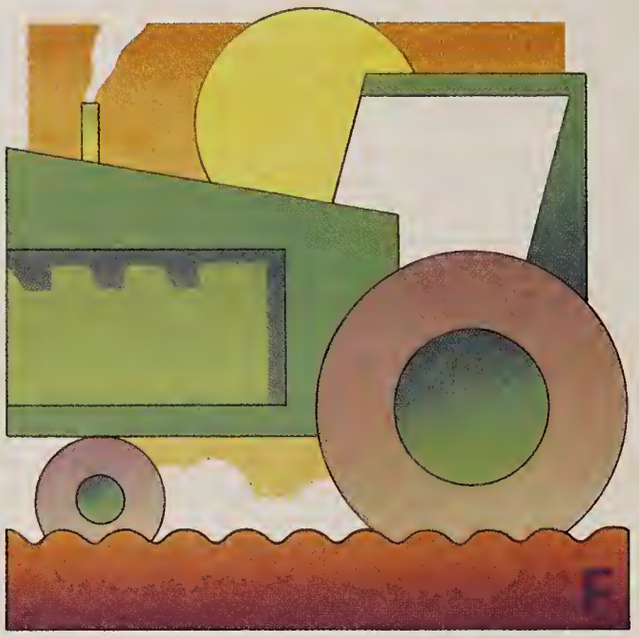
Interpreting satellite data may seem far-fetched to the average business user, but it does highlight some of the limitations current commercial systems have in dealing with large quantities of unstructured data. Similar types of data, although admittedly lessor in quantity, are in many commercial processes and are becoming integral to many processes in production oriented businesses.

Another more down-to-earth problem is the integration of information and systems from different sources or vendors across different hardware, software and network configurations. The proliferation of personal computers and the emergence of the "Information Highway" personify this problem. Specifically, how will all these computers be connected together, and will any of their communications be intelligible across such widely dispersed networks? Larger, more complex software systems, geographically distributed computing and a consistently growing demand for additional functionality have delivered us forever into a very complex world.



Complexity and the multitude of different systems that must be integrated have created the need for a complete change in the way we conceive, design, build and maintain computer systems. This new environment and the ever-increasing power of hardware are the principle reasons the software industry is moving toward OT. Systems built upon object-oriented techniques lend themselves to distribution, integration and faster, more error-free application development. These are the critical building blocks of effective IT systems.

A key part of OT's attraction is that once an object is created, tested and found useful, it can be cloned and used repeatedly.



DEERE AND COMPANY

Deere and Company, a $7 billion global enterprise with 35,000 employees, is moving to integrate OT with existing systems. The company is one of the world's largest suppliers of farm, construction and lawn care machinery. It also has significant financial services operations.

While technologists may argue over the merits of one approach versus another, the overriding goal must be the integration of all information systems into a single system.

Deere, located in Moline, Ill., will implement OT as part of its developing global information system that spans manufacturing, sales, vendors, suppliers and customers. Tom Hein, its manager of technical integration, says, "Our goal is to build an executive information system for management that will change the way business decisions are made."

Deere has installed hundreds of different types of hardware running thousands of software packages that are both internally developed and externally purchased. Each system was purchased for a specific application. These include payroll management, inventory control, checks dispersal, manufacturing control and E-mail.

Forging all of these disparate, working systems together with new analytical tools is a challenge facing many corporations today. Hein lists three requirements that are critical to meeting the challenge Deere has set for itself:

- faster construction of systems through reuse of component objects
- reduced training through advanced interfaces and the retention of familiar systems
- increased employee usage through user-friendly technology.

Reuse of existing systems components emerges as a prime consideration in many Deere projects. A well understood architecture under which common elements can be identified is critical to that reuse. Reuse occurs at both the data and the code levels. Thus, both the data and the overall architecture must be dealt with if objects are to be created and reused throughout the system.

While much of the necessary data is already captured in inventory, payroll, manufacturing, shipping and a host of other legacy systems, the ability to usefully integrate data objects, or aggregate the discrete objects, with existing programs is critical.

One example of structuring legacy systems as an underpinning for new system development can be found in the building of new analysis and integration tools. Deere believes that OT represents the most promising methodology for accomplishing this task. Both the raw data and pieces of information that may be analyzed to make better, more timely decisions exist in the Deere system today.

The biggest concern over integrating existing information with new analysis tools is ensuring that Deere managers gain quick access to more complete operational information.

As Deere's product cycles drop — in some cases to under one year — it is more important than ever for the company to enhance the ability of its managers to make critical decisions rapidly and accurately. As a result, Deere has launched multiple projects that heavily depend upon OT. By launching many projects that use a common architecture, the company hopes to build immediately useful projects that can easily be consolidated later, enterprisewide. It is important to note that each OT project is evaluated on its own merit, costs and goals.

According to Hein, "Infrastructure issues are of paramount importance to building a successful distributed object environment." While technologists may argue over the merits of one approach versus another, the overriding goal of the architecture must be the integration of all information systems into a single system.

Realizing this goal will provide additional challenges for Deere as its expanding system moves beyond enterprise boundaries, Hein says Deere must be able to "hook suppliers and customers into Deere's computing activities."

Hein goes on to say that Deere will benefit from OT because its information systems staff will become expert with the technology, allowing the company to plug in future OT products as they become available.

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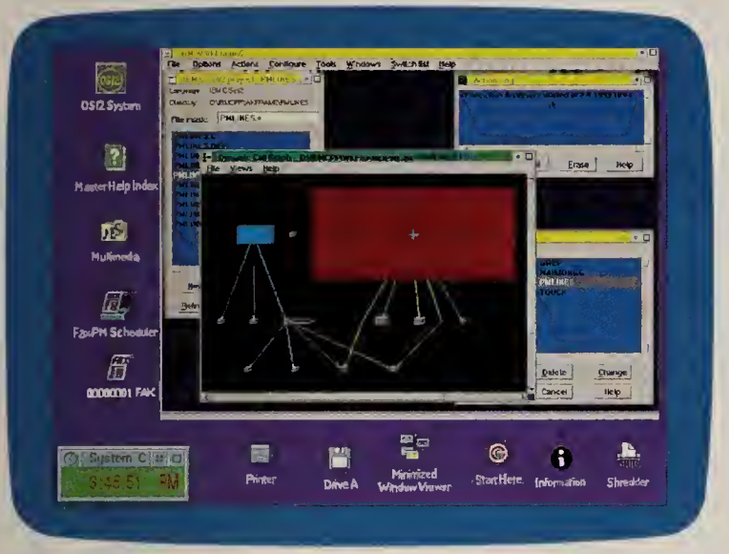

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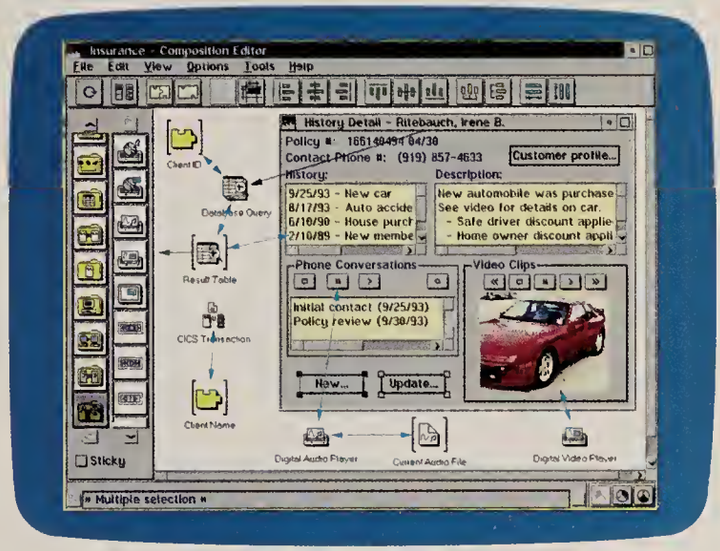

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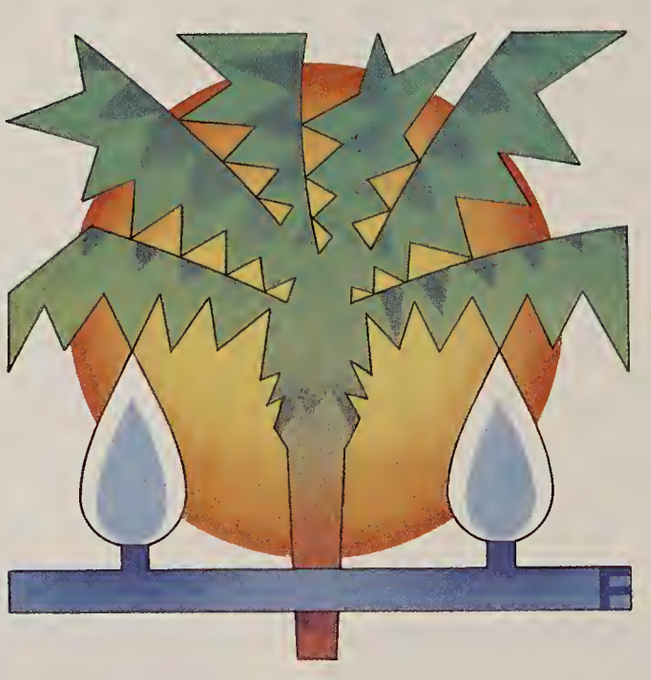


SOUTH CALIFORNIA GAS

South California Gas (SoCal) is one of the largest oil and gas distributors in the United States, servicing customers throughout southern California. Like many large companies, the Los Angeles-based SoCal installed mainframe-based accounting, billing and customer service systems in the late 1960s and 1970s. In 1988 these mainframe-based systems received a new PC front end.

The team rethought the development process, attempted to retain the user-friendly aspects of the old system and worked to gain maximum user input on the new system.

In a project that began in December 1991, and is scheduled to conclude in 1995, SoCal is making the transition from that current system (PC front end/mainframe back end) to a new OT-based system. This new system has a new PC front end, greater dispersion and integration of back-end services. It was created to provide SoCal with a customer-focused system that is flexible and adapts well to change. The current deregulation in the gas industry is requiring a greater customer focus and creating the opportunity for many new service offerings. The original system was designed for one service offering: bundled gas sales, while the new system should enable SoCal to offer customers choices in services and service levels.

Specifically, the system will allow the SoCal administrators to take orders for new service, follow up on billing issues and provide the field force with information on starting and stopping service to its customers. When completed it will serve 1,200 primary and 800 secondary SoCal employees.

The SoCal development team, led by project manager Debbie Taylor, was faced with several significant challenges. One was maintaining favorable aspects of the former system while adding new functionality. The 1988 PC facelift solved many problems and was deemed a successful upgrade to the existing mainframe system.

The initial challenge presented to the SoCal team was upgrading the character-based PC front end's functionality without losing current functions, incurring high retraining costs for users. "It was crucial to develop a detailed design and architectural framework before people sat down to code," states Taylor.

The design particularly benefited from the continued involvement of the actual users, who reviewed the code produced by the development team. SoCal administrators used a command line system that allowed user access.

After Taylor and her team analyzed the problems and potential approaches that would address their situation, they settled upon an OT strategy. This allowed them to more easily develop and implement the project in pieces while testing and modifying each along the way. And it gave them the flexibility to incrementally upgrade each part of the system, while leaving the other parts intact.

Taylor and her team quickly saw how, with the proper upfront design, they could achieve a high de-

gree of reuse even in the early stages of the build phase of the project. However, one large obstacle had to be overcome. As Taylor notes, "One of our big problems was in producing metrics that made sense. You just can't have a major project and not know if you're on track." From the OT-based analysis and design right through project implementation, the OT approach did not readily lend itself to the familiar project management tools SoCal management was accustomed to. This meant that before the SoCal team could gain the backing of upper management it had to develop its own metrics.

The development team was challenged by management to show that it could effectively deliver this project both on budget and with a low degree of technical risk. To accomplish this the team rethought the development process, attempted to retain the user-friendly aspects of the old system and attempted to include maximum user input on the new system. This led to joint workgroups composed of developers and users who mutually worked on all aspects of the new interface.

These workgroups defined the new user interface, then linked that interface to an object model and an underlying repository. Central to this effort was the ability of the users and developers to draw a strict relationship between screen objects that the users could feel comfortable with, and the underlying objects model. A user-familiar object would be displayed on a PC screen and through the manipulation of that object the user would invoke actions in the underlying object repository that would then be transparent to the user and invoke processes on the mainframe.

This development approach encouraged early user involvement and established a strong conceptual basis for OT. The team defined 438 windows to construct during the project. Each window is built up from many objects and therefore represents an opportunity for reuse of objects from window to window, although reuse was not a major goal of the development team. The window objects represent common business functions for SoCal. An example of this is an administrator accepting an order to begin gas service or to fix an appliance. In either case, much of the information collected is the same: customer name, address, etc.

To produce all the necessary software for the 438 windows, reusing components among the windows became imperative. The team ran several pilot projects testing its ability to forecast and monitor the OT development process, as well as meet user expectations. The issue of maximizing reuse was difficult to manage, particularly between the many windows and underlying mainframe applications that supplied information used in the screen objects. The collected customer data is augmented with billing or financial information from the mainframe accounting program.

An issue which quickly arose in the design portion of this project was the need to establish the correct level of granularity for objects. The team ended up recognizing the need for several levels of granularity. The lowest level of granularity might not be reusable unless aggregated to a higher level. This would be exemplified by the ability to represent a "customer name" as an object, but only being able to reuse that object as part of an aggregated higher level object called "customer profile." The customer profile object would then be reused in multiple user screens. When changes were made to any of the component objects by other administrators, or through the processing of programs on the mainframe, the customer profile object would reflect these changes transparently to the user. The advantage of this design is that the administrator always has immediate access to the latest information in a manner that minimizes required training on the system.

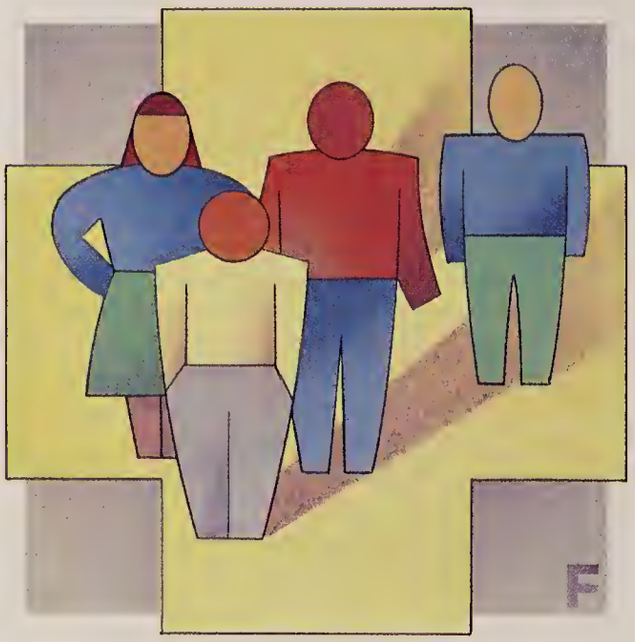
This type of early design discussion made reuse at the proper level of granularity much easier between the many windows and other components of the project. Once the pilot projects were successfully completed, the project was launched for real. It began in June 1992 and high level design was completed in September 1993. The construction phase is going on now and is expected to be complete in October 1994. Systems testing will then commence and run through installation on Labor Day 1995.

It is clear that adjustments in process must be made. In addition to providing adequate metrics, Taylor says her group must:

- create a new set of testing procedures for regression testing each completed component, rather then waiting and testing entire programs
- completely involve users in all phases of the development process. Taylor credits Anderson Consulting with lending the experience necessary to guide the team through the many architectural and methodological choices that were necessary in the early stages of the project.

The results for SoCal, so far, are a project that is on track, on budget and meeting with an enthusiastic response from end users. The SoCal development team is delivering increased functionality through the creation of windows that display objects familiar to the end users. This new functionality is delivered in a familiar way that the users can easily learn and use. On the technical side, the team spent far longer in the design and architectural development phase then would be necessary in a traditional procedural development project. This time has been made up in the production phase by the reuse of objects from window to window.

Joint developer-user workgroups define the new user interface and link that interface to an object model and an underlying repository.



GROUP HEALTH

The challenge is supporting the use of OT in a manner that allows control and increases the organization's understanding of the technology.

How does a company move toward OT? Larry Landis, senior systems programmer at Group Health, Inc., in Minneapolis, says his organization has taken a conservative approach. Prior to implementing OT, management in both the business and technical areas of Group Health had the impression of OT as "bleeding edge technology."

Although technical people were champing at the bit to implement OT, management did not view it as a technology that would be used widely throughout the organization, or adopted without a rigorous review of the risks attendant with its use.

Many managers stated bluntly that during their careers they had been presented with "a belly full of silver bullets and unkept promises" from other technologies leading to a general mood of go-slow-and-be-sure before committing to change.

The issue Landis must therefore deal with is building confidence and trust in a promising new technology within a large corporate MIS environment. Landis, who works in the corporate development center, has the job of evaluating new technologies for their eventual use by Group Health. This puts him in the position of both gatekeeper and evangelist for these technologies.

One of his principle concerns, and a concern at many organizations, is the investment in training Group Health will have to make in new technologies and products. This concern is constantly weighed against the potential benefits of new technologies such as OT.

Despite the hesitancy, there is a growing understanding and acceptance of OT as a preferred method for approaching many problems that exist within Group Health. The challenge is supporting the use of OT in a manner that allows control and increases the organization's understanding of the technology. This is being done by submitting each project to a rigorous screening, and then only approving those that demonstrate high potential and offer readily available and dedicated teams.

Despite the hesitancy, there is a growing understanding and acceptance of OT as a preferred method for approaching many problems that exist within Group Health.

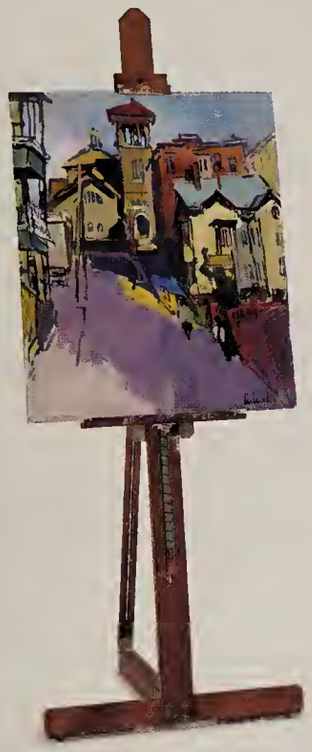
As a result, according to Landis, "The company has several OT projects afoot and others in the planning stages." This approach gives aggressive young programmers who want to immediately plunge into OT projects a golden opportunity and gives managers a chance to closely monitor OT projects.

Landis sees the acceptance of OT in Group Health as an "inevitable, but gradual process." As early projects prove successful or people learn from the mistakes of others, OT will expand at Group Health. The few projects underway have begun to convince some technical managers that OT provides a viable option in some cases.

The approach adopted by Group Health allows OT projects to be championed by supervisors and programmers who have the initiative to demonstrate the technical and business validity of OT.

A few years ago any proposal to use OT would have been dismissed out of hand. Now, the technology is getting a fair trial. As he looks to the future, Landis says, "I expect to see OT recognized as a viable option for system development at Group Health."

CHOOSING AN OO METHODOLOGY?



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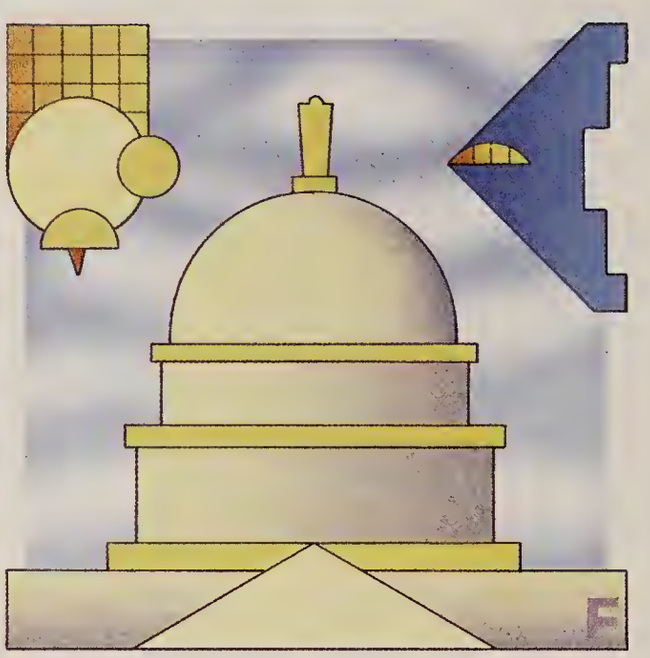


The MITRE Corporation of Bedford, Mass., is a nonprofit organization that specializes in government systems engineering. With 5,000 employees worldwide, the company takes on projects for various governmental agencies. MITRE is currently working on several projects that are rapidly proving the power and flexibility of OT.

Webster Anderson and Dr. Myra Prelle, co-chairs of the Object Technology Architecture Committee for MITRE, addressed several ongoing OT projects at MITRE. "Having a global software environment is forcing us to deal with the tremendously difficult issues of application integration," says Anderson. "Issues include common protocols, resource management, resource allocation, and the big one for the government, application/system acquisition."

In one large governmental project, MITRE has been asked to build a system that will allow data and information integration to support an analytic process. The concept is simple and not at all dissimilar to the situation faced by many commercial companies.

A number of dispersed computers of many different hardware and software configurations collect and process data that must be integrated into a single information source for management analysis and proposed action.

In looking at the technical issues involved, the MITRE team chose an OT approach based on the Object Management Group's Common Object Request Broker Architecture (CORBA). The MITRE team felt that the growing acceptance of CORBA as a worldwide standard would provide a solid basis for development. It also liked the growing vendor endorsement for CORBA that promises support for future system components and enhancements.

In the early pilot for this project, the MITRE development team experienced tremendous success in melding together commercial and government-developed applications through CORBA. The legacy systems continued to function and issues of integration, resource allocation, resource management and resource availability were all addressed successfully.

"The legacy systems were built to hog all the resources," Anderson notes. "When they run they demand control. They're like three-year-old kids with no concept of sharing." By developing OT applications, the team was able to construct systems that easily integrated existing information from disparate sources and supported future enhancements.

Dr. Prelle addressed an Air Force Electronics Systems Center program that MITRE is supporting, called Contingency Tactical Air Control Systems Automated Planning System (CTAPS). This project deals with the integration of geographical, tactical, planning, weather and equipment information for the development of an air battle plan. The results of this integration and analysis are contained in a lengthy tasking document approximately 800 pages in length.

Currently the system encompasses 24 components which were originally automated manual processes. These components were integrated into the current CTAPS system. There are 2.5 million lines of code, written in several different programming languages, including ADA, C and C++. Multiple database systems are used, including Sybase and Oracle. The system runs over a multiprotocol network.

MITRE has been asked to investigate migrating to a common architecture from the existing system. The goal is to shorten response time, increase system flexibility and reduce the overall complexity of the system. The MITRE team decided that a fresh architectural approach that encouraged reuse of objects among the many system components was needed.

As the components of CTAPS were not originally designed to function together as an integrated system, many common functions such as the alert function were developed multiple times. This resulted in many slightly different pieces of code all trying to accomplish essentially the same function across the components that make up the current system. A common reusable "alert object" would save significant time and effort in all phases of the project (design, development, testing and maintenance). It would also ease integration of the components.

Dr. Prelle notes, "There are a set of common services that all distributed infrastructures are going to need. Identifying, implementing and standardizing those services is a critical growth issue for object technology right now."

By developing OT applications, the team was able to construct systems that easily integrated existing information from the disparate sources and supported future enhancements.

BROOKLYN UNION GAS

Brooklyn Union Gas (BUG) is one of the country's largest distributors of natural gas. The company employs over 3,500 people and services more than one million customers in the New York City boroughs of Queens, Brooklyn and Staten Island. In June 1992 Harvard Business School published a case study entitled "Brooklyn Union Gas: OOPS On Big Iron" (reference number 9-192-144). In that study Espen Andersen and Benn Konsynski detailed the building of the CRIS II (Customer Related Information System) by BUG between 1987 and 1989.

This study detailed the principal benefits that accrued to BUG through the implementation of a new OT-based system running on their mainframe. Those benefits included flexibility, reuse and a closing of the "semantics gap" between programmers and users. That system has now been successfully installed for over five years.

According to Tom Morgan, manager, technical development, BUG is currently working to develop an Object Request Broker (ORB) for the original mainframe OT system. The ORB will be designed in the style of the Object Management Group Common Object Request Broker Architecture (CORBA) specification and will provide remote messaging, surrogate objects and a replication service. In the field, data entry screens are being developed that will replicate a gas meter. This means that BUG employees will have a virtual gas meter on their workstation screen and, by changing the fields just as would be done with a real gas meter, the system will capture the changes and issue the appropriate back-office actions.

This new user interface will cut down on field training and motivate BUG field personnel to use the new system. By tying these remote devices to the mainframe OT system, BUG will generate automatic changes or updates in several systems. For example, a change to the reading frequency of a gas meter could generate a change to the routing of meter reading personnel, their schedules and even field staffing requirements for a given day.

The initial claims of reuse from the mainframe installation have withstood the test of time. The development of a new workstation interface will provide a new layer to fit over the existing system, while retaining its lower two communication and computational layers.

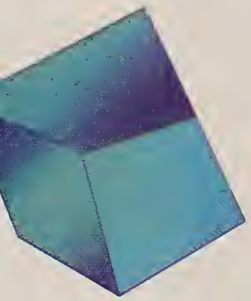
By retaining the lower two layers with little modification, the development team is able to focus its resources on developing the new workstation interface without re-engineering the older system. Morgan sees no end to the incremental improvements that can result. With the addition of an ORB to the mainframe, the workstations will be able to remotely invoke the more than 10,000 behaviors resident in the current system. This will enable BUG to dynamically change the system on demand, thus producing a level of flexibility that a traditionally developed system could not match.

Within a few years each field service person may have a wireless terminal capable of instantly updating all back-office functions. This would include instantly checking and correcting account status, and initiating or terminating service. Other capabilities would include processing bills immediately, which would result in lower administrative costs and faster customer service.

Morgan thinks BUG will migrate incrementally from its terminal-to-mainframe system to a distributed computing environment. By being able to concentrate its development resources on incremental improvements, BUG can allocate IT resources toward improving system service rather than maintaining inadequate and aging programs.

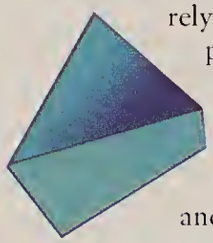
The team rethought the development process, attempted to retain the user-friendly aspects of the old system and worked to gain maximum user input on the new system.

By being able to concentrate its development resources on incremental improvements, BUG can allocate IT resources toward improving system service rather than maintaining inadequate and aging programs.



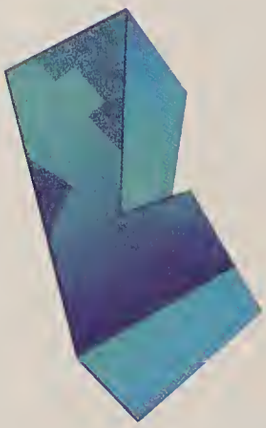
summary

The themes that run through successful OT projects are both strong and consistent. To be successful a project leader must have clear goals and management must support the system. Time spent on planning, design and architectural considerations is the most valuable time spent on the project. Without a strong architecture the project will probably not be successful. Object technology requires experience and training. Successful projects rely on the in-house or consulting experience of people who have done it before. Building a strong team with end users and developers is another critical key to success.

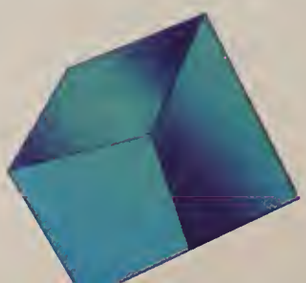


Object Technology development is fundamentally different from traditional data and information system development. Implementors must plan for the time needed to learn and become accustomed to the new approach. A piece of advice: Pick a project for solid business and technical reasons, not just to try out a new technology.

While OT provides strong new capabilities for projects where integration, rapid change and flexibility pay off, a hurried, poorly planned, or resource-poor project will end up a disaster. There are never enough tools, or at least not the right ones, for the job, but the lack of perfect tools is no reason to delay starting OT projects. Object libraries, frameworks, methodologies, languages and object bases are either currently available or will be soon.



The pressure on IT departments to integrate existing applications with dispersed PCs into distributed information systems is pushing the industry toward open, multivendor systems that are increasingly object-oriented. This movement will not be without its blunders and mistakes, but the direction is clear, the momentum is building and the number of success stories is growing.



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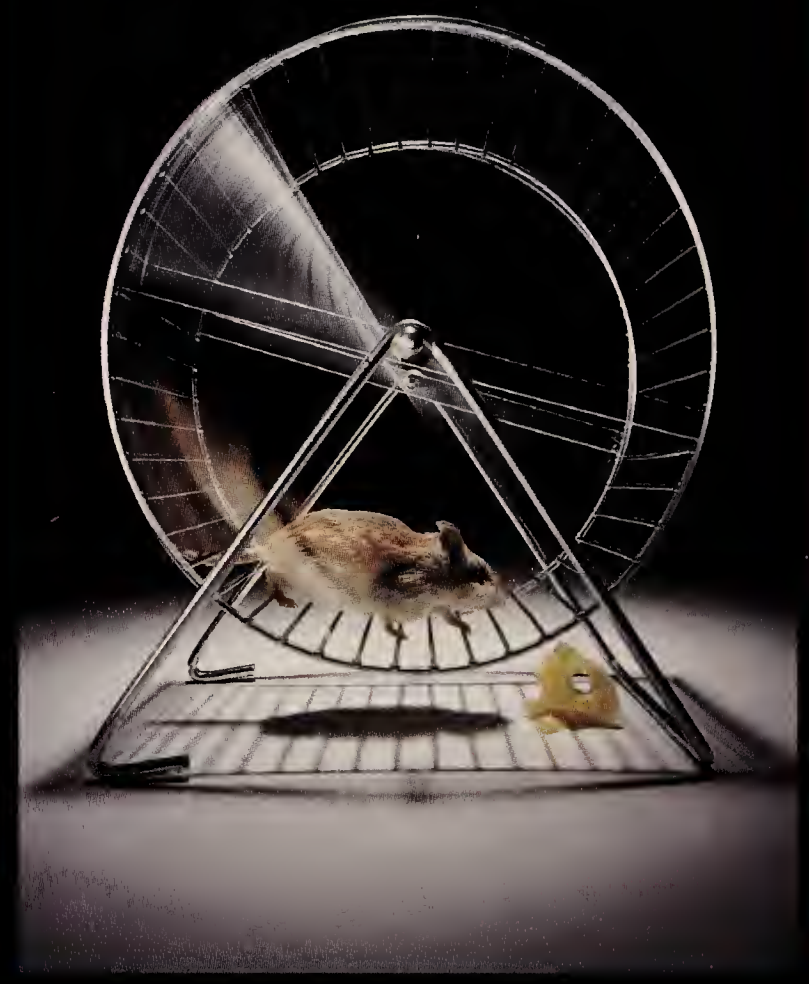

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Chicago may stall NT sales

CONTINUED FROM PAGE 45

end, computer-aided design and publishing applications on PCs instead of more expensive workstations. The revelation that Chicago will also feature OpenGL blurs the reasons why users should choose Daytona over Chicago on desktops, analysts said.

"If they put OpenGL on Chicago, that's going to kill any reason to buy Daytona for workstations," said Brent Williams, an analyst at International Data Corp. (IDC) in Mountain View, Calif.

Very competitive

The conflict is partly a result of competition between the two Microsoft development teams.

"[The NT developers] think of Chicago as a place holder for Cairo, but of course the Chicago team disagrees," said Jesse Berst, editorial director of the "Windows Watcher" industry newsletter in Redmond, Wash. Cairo, the next major update of NT due out late next year, will add the Chicago user interface and an object-oriented file system.

"If they put OpenGL on Chicago, that's going to kill any reason to buy Daytona for workstations."
— Brent Williams, analyst, IDC

The confusion over marketing messages regarding which version of Windows they should choose continues to give users a headache.

Last month, for example, Microsoft began running an advertising campaign to re-emphasize the competitive viability of Daytona in the high-end desktop operating systems market, calling the client version Windows NT Workstation.

"These ads make me think they still want to emphasize two products [on the desktop]. It seems to be a matter of whether you want the more advanced interface sooner or later," said Scott Russell, an information systems manager at Georgia Pacific, Inc. in Atlanta.

Waiting and waiting

Users may have a longer wait than expected for Chicago, however. Although Microsoft Chairman Bill Gates promised last month that it will ship by year's end, Windows 4.0 now appears to be slipping again — this time to March or April of next year, sources close to the company said.

Daytona, which is currently in beta testing, does provide some compelling reasons for users to reconsider whether to use it on desktops — primarily its improved performance and smaller speed. It is scheduled to ship in the third quarter.

"If Daytona keeps tracking the way it is now, the choice between Daytona and Chicago may not be so obvious anymore," said Brian Moura, IS manager for the city of San Carlos, Calif., commenting on the performance differences.

However, Moura and other users are reluctant to support two different versions of the Windows interface

"[We] will have an interesting choice to make, and that is, do we continue using Windows 3.1 and skip Chicago and have Windows 3.1 on desktops [along] with Daytona, or do we forget NT for a while longer and put everyone on Chicago?" Moura said.

Definitely coming

Microsoft officials confirmed the decision to add the OpenGL libraries to Chicago but said the vendor has not yet decided how they will be provided.

"It's definitely not in Chicago when it ships, but we're definitely committed to OpenGL as a general graphics library," said Rogers Weed, Chicago product manager. According to Weed, the libraries might be supplied separately rather than as an interim update to Chicago or through independent software vendors with graphics applications, for example.

Additionally, Weed said he does not believe the move would scavenge NT workstation sales but that Chicago needs to be capable of running graphics games and other products that would run on the more capable PC hardware coming out in the near future.

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New Products

PreMax Electronics, Inc. has announced the FM-288I, a 28.8K byte/sec. data fax PC card modem.

According to the Sunnyvale, Calif., company, the product allows data transmission speed conversion of up to 115.2K byte/sec. and fax send and receive transmission rates of 14.4K byte/sec.

The product allows users to send and receive faxes while they continue to work on their applications. Users can also schedule specific transmission times, combine documents from several Windows applications into one fax and export faxes into graphics files.

The FM-288I comes with fax and communications software for Windows.

The FM-288I costs $495.

▶ *PreMax Electronics*
(408) 739-7000

Workstation Technologies, Inc. has introduced the Color Analog Video Conferencing System, a product that operates over a single standard phone line.

According to the Irvine, Calif., company, the system comes with operating software to manage the digitizing, compression/depression, host interface and communication drives.

The system produces a 160-by 120-pixel color picture along with an audio signal and allows users to select from among three operating modes to dictate image quality. Frame rates are from 6 to 15 frames per second.

The Color Analog Video Conferencing System costs $2,000 for a quantity of 250 users or more.

▶ *Workstation Technologies*
(714) 250-8983

Claris Corp. has announced Claris Organizer, a personal information manager for the Macintosh, and ClarisImpact 1.0, an integrated cross-platform graphics application.

According to the Santa Clara, Calif., company, Claris Organizer seamlessly integrates calendar, contacts, tasks and notes in one application.

Features include automatic linking, drag-and-drop flexibility, smart find, automatic completion and easy import/export.

ClarisImpact 1.0 for Power Macintosh offers instant organizational charting, data charting, project scheduling, calendaring and complete free-form graphics capabilities.

Claris Organizer costs $99, and ClarisImpact 1.0 costs $399.

▶ *Claris*
(408) 987-7000

View Software, Inc. has announced Long File Names for Windows 2.0.

According to the Palo Alto, Calif., company, the product allows users to create file and directory names of up to 255 characters for most Windows applications in single-user or networked environments.

Version 2.0 is file-compatible with DOS and Windows. It works from within the applications without new commands.

Long File Names for Windows 2.0 costs $29.

▶ *View Software*
(415) 856-8439

Hewlett-Packard Co. has introduced JetDirect cards with enhanced functionality for attaching HP printers and plotters directly to LANs.

According to the Palo Alto, Calif., company, the cards, which are available in Ethernet, Ethernet/LocalTalk and Token Ring configurations, offer increased functionality and ease of use.

The JetDirect cards work with all HP printers and plotters with HP modular I/O slots.

Prices range from $369 to $619.

▶ *Hewlett-Packard*
(415) 857-1501

New Media Corp. has introduced the New Media SVGA card, a PCMCIA Super VGA adapter for the Gateway 2000 Handbook.

According to the Irvine, Calif., company, the card allows users to connect the Handbook subnotebook computer to conventional VGA monitors.

The card comes with plug-and-play capability and all the features of desktop Super VGA adapters, including an option for on-card BIOS and driver support for a large number of commercial applications.

The New Media SVGA card costs $349.

▶ *New Media*
(714) 453-0100

Miro Computer Products, Inc. has introduced the MiroCrystal 20PV and MiroCrystal 40PV video accelerators for Windows.

According to the Palo Alto, Calif., company, the products provide graphics performance in true color, with full-motion digital video playback at resolutions of up to 1,280 by 1,024 pixels.

The accelerators are designed to enhance the visual impact of Windows-based digital video playback by allowing users to view any Video for Windows segment at full-screen resolution with full-motion television quality.

The MiroCrystal 40PV includes a flicker-free 75Hz vertical refresh rate, and it can display images as large as 1,600 by 1,200 pixels in 16-bit color at a refresh rate of 70Hz.

The MiroCrystal 20PV costs $699, and the MiroCrystal 40PV costs $999.

▶ *Miro Computer Products*
(415) 855-0940

Individual Software, Inc. has announced AnyTime 2.1, a Windows personal organizer.

According to the Pleasanton, Calif., company, AnyTime 2.1 retains the same features as AnyTime 2.0, but it adds the ability to import and export data.

AnyTime 2.1 provides portrait versions of weekly printouts, the ability to copy appointments, to-do's and addresses formatted for pasting into other applications.

A Quick Glance feature lets users get a weekly, monthly or annual view of their schedule in graph or calendar format.

AnyTime 2.1 costs $49.

▶ *Individual Software*
(510) 734-6767

Global Village Communications, Inc. has announced the PowerPort/Mercury, a high-speed, fully internal fax/modem for Apple Computer, Inc.'s PowerBook 500 series.

According to the Mountain View, Calif., company, the product tranfers data at speeds of up to 19.2K byte/sec. and sends and receives faxes at 14.4K byte/sec.

The PowerPort/Mercury includes fax software that lets users easily send and receive faxes from within any application and convert incoming faxes into word processing, spreadsheet and database formats.

The PowerPort/Mercury costs $399.

▶ *Global Village Communications*
(415) 390-8200

Product shorts

Dolch Computer Systems has announced the Embedded Control Interface series of embeddable computing systems and integrated flat-panel displays. Designed for easy mounting and use by OEMs, the series hosts a 486 computing system with on-board capabilities for network communications, fully bootable diskless operation and PC 104 bus expansion. Display sizes range from 8.4 in. to 14 in. Cost: Starts at $4,100 for matrix monochrome displays and $4,995 for color displays. Dolch Computer Systems, Milpitas, Calif. (408) 957-6575.... **Epson America, Inc.** has introduced the LX-300, a compact, color, upgradable 9-pin impact printer. The product offers increased print speeds, a smaller footprint, quiet operation and two interface ports. Cost: $239. Epson America, Torrance, Calif. (310) 872-0770.

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THE EXPERTS IN DISTRIBUTED SYSTEMS MANAGEMENT

WordPerfect Office successor fills gap

Now called Symmetry, it still leaves room for improvement

By Lynda Radosevich

With the recent 4.1 release of its Office electronic-messaging package, WordPerfect Corp. has addressed some scalability, reliability and openness issues and added many welcome new features, beta users said.

However, performance of the client software, which was widely reported as being slow in Version 4.0, still garners mixed reviews, and other issues remain.

Now named Symmetry, Version 4.1 is the first major update to Office 4.0, which WordPerfect shipped last fall. Office 4.0 was a completely rewritten version of WordPerfect's integrated office productivity application.

While the new product added many ground-breaking LAN electronic-mail features such as tightly integrated messaging, scheduling and task management, many users said it behaved like a 1.0 release.

More organized

"Before, it seemed that messages wouldn't be delivered, attachments got lost and pointers were missing, so I had to reorganize the corrupted database once a week" said Brandt Ball, an MIS manager at Scene Three, Inc., a television production company in Nashville. "Now 4.1 addresses these issues, and I'm not required to run maintenance," he said, adding that he still does so once a month for peace of mind.

Ball also reported seeing a roughly 25% performance increase in the DOS client and 50% in the Windows client, which "in Version 4.0 was deathly slow." However, other users said the Windows client still ran too slowly.

For Ron Raes, vice president of advanced technologies at Weyerhaeuser Mortgage in Woodland Hills, Calif., a 4.1 Novell, Inc. NetWare Loadable Module (NLM) server version is welcome because it allows him to run messaging and NetWare file services on one server.

In beta tests, Raes said he ran Symmetry 4.1 as an NLM on five servers that support roughly 300 users and did not see any performance problems. In the next several months, he plans to add another 900 users. He said he does not expect to run into scalability problems.

Choice features

Companies that chose WordPerfect Office over Lotus' CC:Mail and Microsoft's Mail said they did so because of the following features:

- Integrated scheduling, task management, forms routing.
- Lower cost.
- Central administration of multiple post offices.
- Address change propagation across servers.

Support = streamlining

Support for Microsoft Corp.'s Messaging Application Programming Interface (MAPI) is another item that tops his interest list, Raes said. MAPI support will enable Weyerhaeuser Mortgage to mail-enable its company-standard Microsoft Word and Excel desktop applications. That is a key part of the company's effort to streamline and automate paper-intensive business processes, he said.

Also, Raes is looking forward to

Office, *page 80*

Commentary

Jean S. Bozman

In search of order

Users see confusion ahead in the coming convergence of PCs and workstations — and many of them don't like it. In an effort to stake out familiar territory before the marketing whirlwind hits, some users are scoping out standards that will impose some order on distributed data processing.

The user concern is timely because many vendors are already telegraphing their plans to mix and match hardware and operating systems — or unveiling the first wave of "enterprise desktop" machines. Those are machines that act as clients but access many types of servers through point-to-point client/server computing or Internet-style peer-to-peer computing.

Learning to read the box

By 1995, it will be hard to tell by the label on the box which operating system a computer will run. High-end Pentium PCs are already pulling into the power range of Unix workstations — as measured by SPECint92 benchmarks. And soon, PCs and workstations will be able to run a variety of 32-bit operating systems from Microsoft's Windows NT to SunSoft's Solaris to

Bozman, *page 76*

Negotiating pays off in client/server

By Rosemary Cafasso

■ Faced with the current complex pricing structures in the client/server applications market, the best strategy is to sharpen your negotiating skills, users and consultants advise.

Longer term, client/server software providers are expected to simplify pricing models. Dun & Bradstreet Software and SAP America, Inc., for example, have committed to making their multifaceted pricing plans easier. But in the short term, observers said the way to cope is to set clear ground rules when negotiations begin.

For example, Texaco, Inc. now uses a white paper on software licensing published in 1993 by the Open User Recommended Solutions (OURS) group when it negotiates deals, said John Murphy, director of information technology at Texaco and an OURS board member.

The white paper provides a set of general principles that amount to a code of good behavior that both parties are expected to live up to. It includes such statements as: "The perceived value of software is user-specific."

The document also contains a lengthy glossary of licensing terms so both parties can agree on the meaning of certain phrases, such as concurrent-user license.

Future plans

Client/server applications vendors plan to make pricing easier. But today the number of pricing plans just about equals the number of software providers.

Learning to agree

"The thing that has helped us recently is we got vendors and users to discuss some of these issues and come to an agreement on a set of principles," Murphy said in describing the OURS work.

Prior to the white paper, "everyone was talking their own terminology and saying things that may not have been understood," Murphy said. The white paper "has leveled the playing field," he added.

Michael Meyer, an executive vice president at Cap Gemini America, Inc., a New York-based systems integration and consulting firm, recommends a negotiating technique that he calls the "most favored nations agreement." With this arrangement, the customer asks that his deal be equal to whatever comparable customers have arranged.

"Vendors will resist this, but the more they resist, the more you know that they are not giving you the best deal," Meyer said.

Gorden Rapkin, vice president of product management and planning at IMRS, Inc., a client/server financial software provider, said users should think ahead so they can negotiate future requirements when they make the first deal.

"It is pretty typical in client/server applications today for people to start out with small projects, so it becomes pretty important to look at what is going to change as it gets bigger," Rapkin said.

Total-cost theory

Other observers suggest looking at enterprise or site licenses that can set a total cost for a bundle of services and add-ons that come with the software. PeopleSoft, Inc., for example, offers an enterprise license as an alternative to its standard pricing structure that factors in several items, including the size of the user company, the server, the number of workstations and the software itself.

The catch with an enterprise deal is many users are just venturing into client/server and want to work with a small pilot before committing to a product for corporatewide use.

"The way you do it is negotiate the enterprise deal, [sign] a letter of intent, and then sign a specific work order for a pilot with an agreed upon price for that piece of work only," Meyer said. "That way, you can get your cake and eat it, too."

In the end, the free-for-all nature of client/server application pricing could work in the customer's favor, at least according to one user.

"You sit at a table, you want them to throw you a figure," said Doug Gosling, manager of financial systems at Ontario Hydro. "If they can't do that, it can create uncertainty. But if it's negotiable, then you can attain some advantage."

Bozman

CONTINUED FROM PAGE 75

IBM's OS/2 and Workplace OS.

Some examples of the crossover trend include Intergraph's recent announcement of three 90-MHz Pentium workstations to run computer-aided design and engineering software, SunSoft's Solaris X86 Unix software release for Intel desktop machines last year and Mips Technologies' Comdex demonstration of a 200-MHz Mips RISC chip running Windows NT.

To survive the coming chip wars, some companies are considering standardizing on an Intel chip architecture for servers as well as clients. That would ensure a common hardware platform for all corporate applications, even if some machines run Unix and others run Windows as an operating system.

Use of common applications is yet another route IS managers can take to establish coherence in a distributed environment.

There is yet another way to play the game. Those who plan to stick with RISC hardware from Sun Microsystems or Hewlett-Packard will soon have the option of running several operating systems. Among those being ported to both platforms are Windows NT and Next Computer's NextStep. Even IBM's low-end RISC/6000 systems will soon host a variety of operating systems heretofore seen only on desktop PCs [CW, May 23].

Living in a distributed world

In a distributed world there may be other ways to enforce IS order in this seemingly chaotic environment. For example, some shops plan to use the Open Software Foundation's Distributed Computing Environment (DCE) to level the rocky playing field.

At Wells Fargo Bank in San Francisco, a recent pilot project proved to IS managers that everything from PCs to Unix servers to IBM mainframes could tap into the same DCE servers to find data files across the company [CW, Feb. 21]. At Entergy, a New Orleans utility, DCE is emerging as a common thread for Unix machines, mainframes and thousands of Windows PCs on a single data network [CW, May 9].

Use of common applications is yet another route IS managers can take to establish coherence in a distributed environment. If you use common developer's tool kits, such as Powersoft's PowerBuilder and Microsoft's Visual C, then an application program with a single look and feel can be distributed across the network to run on many types of computers. However, this approach counts on independent software vendors handling most of the porting for each platform.

Finally, but not least importantly, there is a more immediate solution, many users note. Users can turn to their relational database system of choice to unify a distributed environment. That is because databases from Oracle, Sybase and Informix, for example, have already been ported to most major hardware platforms. These systems also have their own remote procedure calls (RPC), which can be used until DCE's RPCs are widely accepted. The trade-off, of course, is that users are buying a vendor-specific database solution.

It may be a little too early to start panicking about the "future shock" that is sure to hit IS shops when the wave of mix-and-match platforms reaches the market later this year. But it's never too early to start planning how your organization will approach the new technology — while not compromising IS' penchant for orderliness in an era of constant change.

Bozman is *Computerworld*'s senior West Coast editor.

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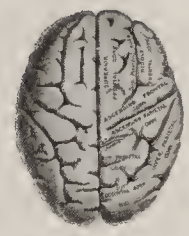

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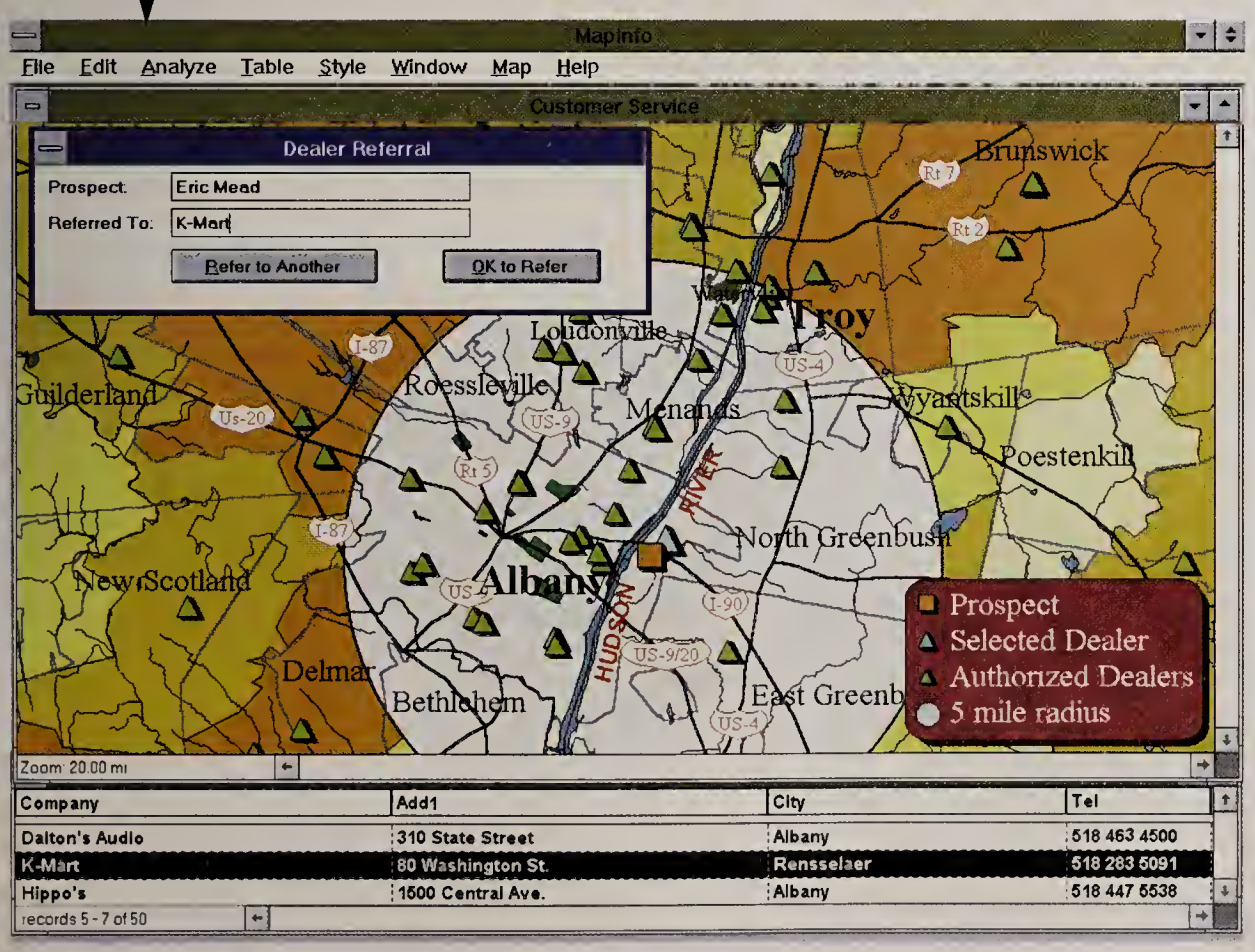

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Auspex rolls out new line of servers

By Jean S. Bozman
SANTA CLARA, CALIF.

Auspex Systems, Inc. updated its entire line of Network File System (NFS) file servers last week but stopped short of expanding its brand of high-speed file serving to new and broader markets.

Even so, industry analysts and users said they expect the firm to eventually market its efficient I/O and disk-storage systems beyond the Sun Microsystems, Inc.-compatible market where it began six years ago. Auspex said its NFS file servers are also used with other Unix workstations, PCs and Macintoshes. All those machines can access the servers by using the NFS or PC-NFS protocols.

"They want to keep their focus, but they do have an option to broaden their market," said Wayne Kernochan, director of commercial systems research at Aberdeen Group in Boston. "This specialized NFS market has quite a significant niche [market] within Novell NetWare environments using PC-NFS."

Some users said they already have PCs on Novell, Inc. NetWare LANs that are accessing data on Auspex NFS servers.

For now, Auspex's focus is on higher performance levels, support for more Ethernet LANs and providing more disk memory for client/server data. The NS 7000 models support 40 to 300 end users, the firm said.

The Auspex systems combine a standard Unix host processor with a proprietary internal design to optimize I/O and disk storage, said Lewis Brentano, group vice president of systems and applications at Computer Intelligence/InfoCorp in Westboro, Mass. To avoid bottlenecks that develop when standard Unix servers are used as NFS file servers, "the file request goes to a disk controller, not through the host CPU, so it's much more efficient," Brentano said. Users run applications on their own workstations or Unix servers, then access data stored on the Auspex NFS servers.

Looking for more

Users of older Auspex systems said they are interested in gaining more disk memory and I/O bandwidth from the NS 7000 machines. "We're out of cabinet space now, so we're busting at the seams," said Ray Fritz, manager of systems administration at Biosym, Inc. The 200-person molecular modeling software house in San Diego has just one Auspex NS 6000 server that holds up to 25G bytes of data for 180 Unix workstation users. Biosym upgraded from the NS 5000 to the NS 6000 six months ago, Fritz said.

The company has considered replacing individual disk drives for higher-capacity drives to gain more storage space on the NS 6000. The number of workstations at the site has nearly doubled from three years ago. "We'll essentially be able to triple our network capacity [with the NS 7000 machines], which is what I've been waiting for," Fritz said.

Still others are planning upgrades that will place more memory and disk-drive storage on their shared NFS file servers. "We're at about 30G bytes altogether," said Dan Pitsch, senior engineer at ADC Telecommunications, Inc. in Bloomington, Minn. Pitsch's firm has three NS 5500 servers for mechanical computer-aided design engineers using 70 Silicon Graphics, Inc. workstations.

However, the Auspex servers store only one quarter of about 120G bytes of on-line data, he said; the rest is on users' workstations or on other storage devices. Pitsch plans to include the Auspex servers in the site's migration to hierarchical storage management software for Epoch Systems, Inc. backup optical storage systems. Auspex reached an agreement with Epoch on an interface between their software products and will deliver code this month.

The system's enhanced Unix host processor is based on a Ross Technology, Inc. 55-MHz HyperSPARC chip, while dual 40-MHz SPARC chips handle network processing and NFS file processing. Shipments are set to begin June 25, the company said.

Auspex's NS 7000 NFS servers

Low-end: NS 7000 Series 200 includes three departmental servers, ranging from 1.75G to 61G bytes in capacity. Supports up to 12 Ethernet LANs and two Fiber Distributed Data Interface (FDDI) connections. Prices range from $65,000 to $84,000.

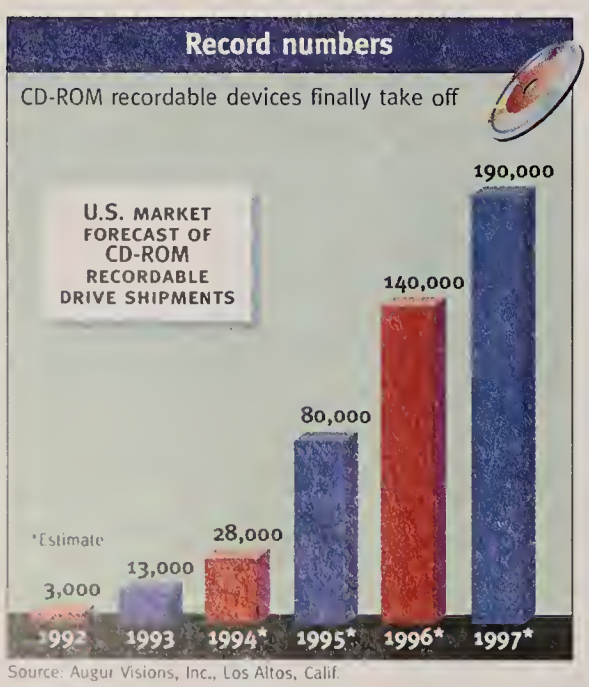
High-end: NS 7000 Series 500 includes four enterprise servers, ranging from 3G to 180G bytes in capacity. Supports up to 24 Ethernet LANs and four FDDI connections. Prices range from $113,000 to $186,000.

CD-ROM devices on the upswing

By Mary Brandel

CD-ROM recordable devices have been available for some time now, but high prices and difficult operations have stunted their popularity.

But later this year and into 1995, prices are expected to drop as the software and operations ease up, boosting sales of these drives, according to a study released by Augur Visions, Inc. in Los Altos, Calif.



Source: Augur Visions, Inc., Los Altos, Calif.

According to the report, 60% of users interviewed are either in the process of acquiring CD-ROM recordable drives for their operations or are interested in doing so.

"There are lots of CD-ROM recordable libraries available," said Bill Frank, president of Augur Visions. "The problem is, no one's got the software integrated to tie it all together, so the user has to buy software here and there."

Uses will likely encompass the following:

- In-house publishing and report distribution.
- Commercial publishing.
- In-house archiving.
- Internal software distribution.

Entry-level drives for archiving and report distribution will become available this year priced at roughly $4,000. More full-featured systems will sell for $5,000 to $10,000.

With street prices near $3,000, "anyone can be in the CD-ROM publishing business," said Bob Abraham, an analyst at Freeman Associates in Santa Barbara, Calif.

Not just games

"When you think of CD-ROM, you usually think of games, which are produced in the tens of thousands," Abraham said. In actuality, the average production run for CD-ROMs is only about 200, which could be handled quite easily by these recordable devices.

"We would like to store [sales data and consultant resumes] on CD and send them out to our branches," said Renee Malones, network administrator at Comsys Technical Services, Inc., a consulting firm in Rockville, Md. "That way, we wouldn't have to give them tie-ins to the corporate office, and they would have faster access to the information."

What Malones said he would like to see is an inexpensive jukebox device that would allow him to stack six or so CDs.

A small number of people in the study mentioned using CD-ROM recordable drives for backup, Frank said. However, the drives are more likely to be used for archiving because they are write-once.

Management tools

Cheyenne updates Monitrix

By Steve Moore

A newly upgraded LAN protocol analyzer and management tool from Cheyenne Software, Inc. in Roslyn Heights, N.Y., aims to provide LAN managers with a low-cost means to monitor the performance, configuration and hardware and software inventory of Ethernet, Token Ring and Arcnet LANs.

New capabilities in the software-based Monitrix 3.0 product include support for Windows, OS/2 and Macintosh, in addition to DOS; enhanced event threshold and notification features; and graphical-trend analysis.

"Monitrix 3.0 focuses on node management rather than device management and can act as an agent to provide information to high-end network management systems such as OpenView and SunNet Manager," said Scott Gordon, Cheyenne system management and product security manager.

Because Monitrix 3.0 runs on the file server, it does not require a dedicated workstation. In addition, Monitrix was designed so it does not require a terminate-and-stay resident program on each PC in the network. Monitrix can deliver alert messages via network broadcast, alphanumeric pagers or any Message Handling System-compliant electronic-mail system.

"Software LAN analyzers are fine if you have a lower-speed shared LAN — anywhere from 4M bit/sec. to 16M bit/sec.," said John Morency, a principal at Strategic Networks Consulting, Inc. in Rockland, Mass. But for networks that must support higher speeds such as Synchronous Optical Network OC3 at 155M bit/sec., Morency said, "With minimum packet sizes, you may be talking 300,000 packets per second, and software LAN analyzers aren't going to do you a lot of good there."

Try it, it's free

Gordon said Cheyenne has teamed up with Funk Software, Inc. in Cambridge, Mass., to offer Funk's Proxy remote-control program free to all users who purchase Monitrix by Sept. 15. Proxy enables Windows users to take over one or more PCs on a network and operate them remotely from multiple windows. Proxy, which sells separately for $395, runs only on Novell, Inc. IPX networks.

Prices range from $495 for the basic 50-node Monitrix 3.0 package to $1,390 for the maximum 2,000-node package. Monitrix 3.0 is scheduled to ship this month.

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intel inside

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Office

CONTINUED FROM PAGE 75

using the enhanced macro language in 4.1 to customize certain Symmetry features. However, in his 4.1 beta release, a minor macro addition slowed Windows client performance down by five to 10 seconds, he noted.

Gary Wilkerson, supervisor of end-user services at Kaiser Permanente Health Care, Inc. in Atlanta, said he liked the ability in 4.1 to run database maintenance without taking down the server. However, now the diagnostic software is not compatible with 3.x releases, he added.

Sticking with users

More impressive than new features in 4.1 is WordPerfect's renewed commitment to users since Adrian Rietveld took over as president last January, Wilkerson said.

For instance, he used to get a monthly CD from WordPerfect with beta software and recent revisions. Without warning, the CD shipments stopped last November. He mentioned the problem to Rietveld during an April visit to Atlanta, and the CD shipments resumed in May, Wilkerson said.

"I'm very impressed that he immediately delivers on promises," Wilkerson said.

Also in 4.1, WordPerfect released a telephony server that lets users dial in and have an artificial voice read back E-mail and scheduled appointments. Several users who saw this feature demonstrated said some of their top executives might like it because they have hectic schedules and do not always travel with notebook computers.

Still not there

However, WordPerfect's path is far from paved yet. Symmetry still has a limited market presence compared with E-mail LAN leaders CC:Mail from Lotus Development Corp. and Mail from Microsoft. Also, users are still asking for the following Symmetry improvements:

- Improved client performance.
- A better DOS interface, especially integration between modules.
- A Windows NT server version.
- Better addressing capabilities and access to X.500 and NetWare directories.

WordPerfect is working on all the requests except the DOS client, according to a company official.

Improvements to Symmetry

WordPerfect's Symmetry, the 4.1 upgrade from Office 4.0, includes the following enhancements:

- **Administration:** Simplified installation and automatic directory synchronization with NetWare bindery.
- **Servers:** NLM, OS/2 and seven Unix platforms.
- **Gateways:** Several new versions including IBM's SNA Distribution Services gateway, which can operate schedule searches on IBM mainframe applications.
- **Clients:** A pager gateway, new remote clients, a Power Macintosh client and seven Unix clients.
- **API support:** Simple MAPI, Vendor-Independent Messaging and Apple Computer, Inc.'s Open Collaboration Environment.
- **More communications options:** Such as TCP/IP and X.25.

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New Products

Peripheral Devices Corp. has introduced FreezeFrame 2.0, software that enables live, accurate backup across heterogeneous Unix networks.

According to the King of Prussia, Pa., company, the product allows users to modify files as the backup is actually taking place, eliminating the risk of corrupting data on an active file system.

FreezeFrame 2.0 captures an instantaneous view of the disk at a particular moment in time, allowing backup utilities to write the original version of an active file to a tape.

Prices range from $295 to $1,995.

▶ *Peripheral Devices*
(215) 265-3300

Software Interfaces, Inc. has introduced SQLassist 3.5, a data access tool that includes support for IBM's DB2 relational database.

According to the Houston company, the product lets users create queries and reports for accessing and utilizing corporate data stored in DB2/MVS, DB2/2, DB2/6000, SQL/DS and AS/400 and retrieves primary and foreign key constraints from random database management systems.

Features include a common methodology for retrieving data from all major random DBMSs, native application programming interface support for DB2 and the ability to handle an unlimited number of tables.

Prices range from $495 to $20,000 based on the type of CPU or user.

▶ *Software Interfaces*
(713) 492-0707

XBD Systems, Inc. has introduced XDB Server 4.0, an enhanced server for distributed client/server computing.

According to the Laurel, Md., company, the product provides flexible performance-tuning options that let users fine-tune the database server to achieve faster response times.

Features include optimized query performance, server-to-server connectivity, improved security and administration tools and full DB2 compatibility.

Prices start at $2,495.

▶ *XDB Systems*
(301) 317-6800

AGE Logic, Inc. has announced XoftWare/32 for Windows, Serial Edition, a PC serial-X server that utilizes standard transport protocols to transmit X Window System applications over thin-wire and telephone lines.

According to the San Diego company, XoftWare/32 for Windows, Serial Edition enables multiple file transfer protocol, Telnet, host log-in and X terminal operations.

The product combines 32-bit PC X server capability with a high-speed serial protocol designed to optimize performance over low-bandwidth telephone lines.

XoftWare/32 for Windows, Serial Edition costs $245.

▶ *AGE Logic*
(619) 455-8600

Puzzle Systems Corp. has announced SoftNet Utilities, emulation software for SunSoft, Inc.'s Solaris 2.x for the x86 environment.

According to the Morgan Hill, Calif., company, SoftNet Utilities enables Intel Corp.-based platforms running Solaris for x86 to also function as a Novell, Inc. NetWare 2.2-, 3.11- or 3.12-compatible server to PC clients on NetWare networks.

The product allows users to log on to a Solaris system as a terminal and run the resident Unix applications using the terminal emulation program of their choice.

Prices range from $1,299 to $5,495.

▶ *Puzzle Systems*
(408) 779-9909

Product short

NekoTech has announced the Mach 1 and 2 series of PC workstations and file servers based on Digital Equipment Corp.'s Alpha AXP chip. Features include SCSI and Ethernet on Peripheral Component Interconnect (PCI) local bus, I/O interfaces for XT/AT bus, PCI, SCSI and Ethernet embedded on the motherboard, and ports for a parallel printer, two serial devices and a floppy disk drive. Cost: Ranges from $3,995 to $12,995. NekoTech, Irvine, Calif. (714) 580-0055.

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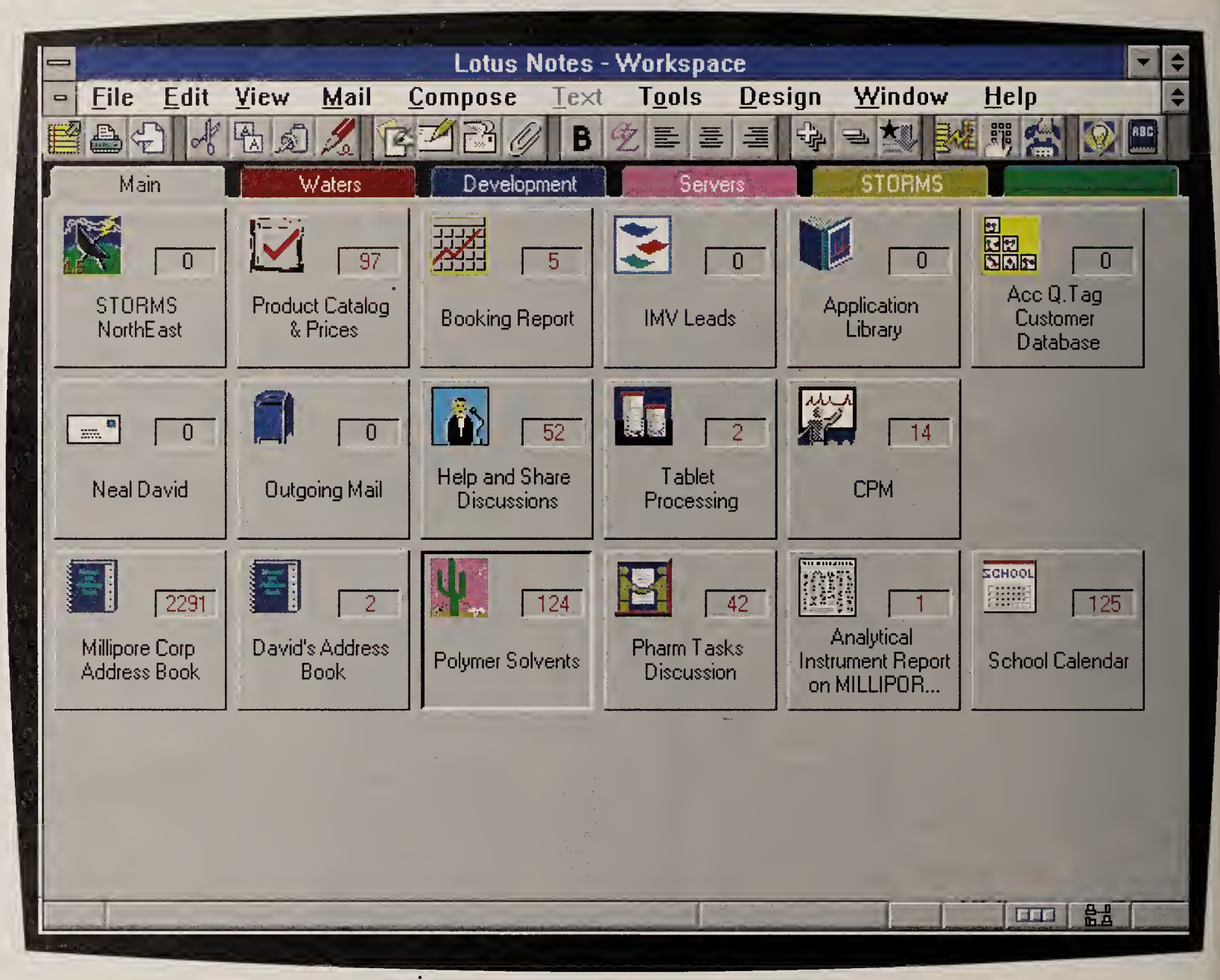

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Liquid chromatographs, as you might expect, are not a simple sell. Sales are generally the result of consultative one-on-one calls and strong customer relationships. This requires a thorough knowledge of the customers, their needs and the technical knowledge that gives a sales representative the credibility to close the sale.

To achieve all this, Waters has developed an innovative Notes application called Sales Transaction and Order Management System (STORMS) that helps the sales organization share information in ways never before possible.

Equipped with Lotus Notes and color laptop computers, Waters' representatives can quickly access account histories, competitive information, product specifications, technical support and other up-to-the-minute intelligence as they travel. Including customer information from other representatives in the field and virtually all the resources at headquarters.

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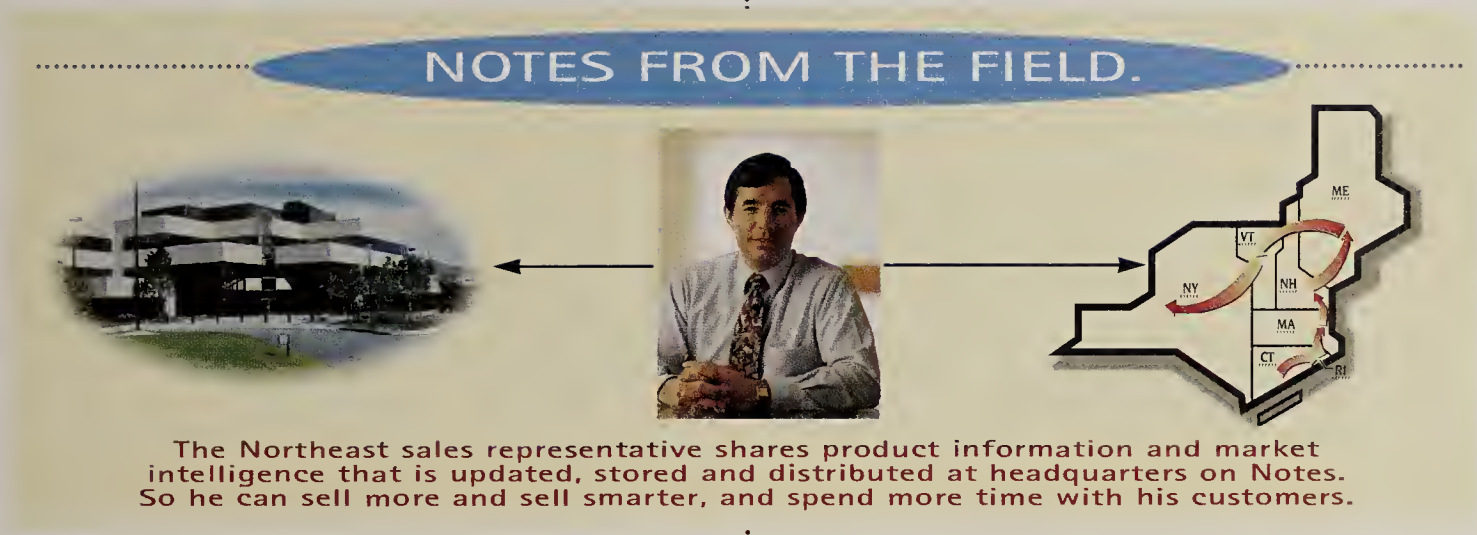
The impact of Notes on sales has been dramatic. The quality of communication among sales people and with headquarters has increased significantly. Information and record keeping that used to be mailed or hand delivered is instantly available through Notes. Now sales management always has up-to-the-minute reporting for more accurate forecasting. And representatives in the field are getting leads while they're hot.



The Northeast sales representative shares product information and market intelligence that is updated, stored and distributed at headquarters on Notes. So he can sell more and sell smarter, and spend more time with his customers.

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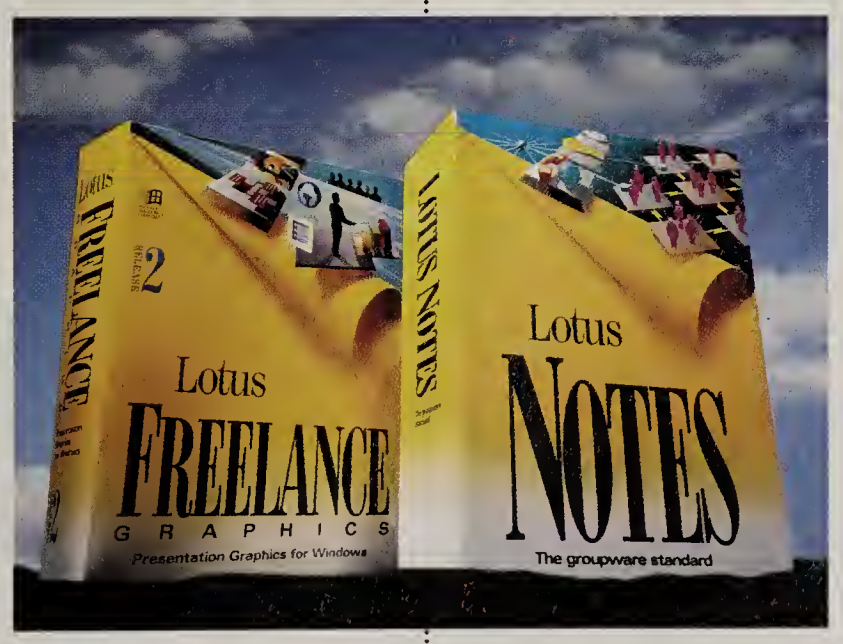

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THE LONG AND THE SHORT OF CHOOSING A ROUTER AS TOLD BY FIRST OF AMERICA.

THE SHORT OF CHOOSING A ROUTER AS TOLD BY PROTEON.

BOB FISHER is the Systems Analyst at First of America Services, Michigan.

"Primarily, we evaluated four routers — Cisco, Wellfleet, CrossCom, and Proteon — for SNA internetworking, IPX and IP capabilities.

" No contest."

"When it came to hardware configuration, Proteon provided extremely easy access. You could pop the cover off and readily change interfaces without having to string a bunch of cables. They provided flash memory for the operating system and configurations, so there was never any booting off a diskette. The LEDs on the front panel were also very nice. A quick look would tell you whether a given interface was up or not. None of the other router vendors provided that. In terms of speed and efficiency, Proteon beat the others hands down. And as far as the overall support for different topologies, Proteon worked well with everything. Unlike other brands we tested, the Proteon router was a true gateway.

" Our router is incredibly easy to use."

"Reliability was another major criteria for selecting First of America's new router. You see, if we can't service our customers, we're out of business. Our network ties together six hundred bank branches. These terminals simply can't go down. So choosing a router to carry this traffic wasn't a decision I took lightly. Proteon proved to have the reliability we need. And if any questions did arise, Proteon's support representatives were readily available and very knowledgeable.

" Proteon's reliability is second to none."

"Our bank is in acquisition mode, so integration is critical. After any merger, we have to integrate new networks into ours while migrating their applications. Right off the bat, our routers have to support all kinds of topologies. By deploying the Proteon DNX router at regional sites, we were able to provide these locations with SNA support very quickly.

" We'll integrate any multiprotocol network."

"In terms of overall technology and performance, I'd have to say the Proteon router is absolutely the best."

" Amen."

proteon

For more details on the First of America story and our free Guide to Integrating SNA and Multiprotocol Networks, call 1-800-830-1300.
Dept. 501

Outsourcers in need of telecom experience

By Mark Halper

Although the public romance between Electronic Data Systems Corp. and Sprint Corp. eame to a quick let's-try-to-be-friends end last week, the attempted merger drove home a point.

If outsourcers such as EDS are to provide corporate eustomers with a strategic edge in today's era of technology convergence, it would help to have data, voice and networking capabilities all in tow, users and analysts noted.

"They're going to have to demonstrate they can bring voice synergies that can bring costs down and provide emerging technologies. Hence, there will have to be alliances, mergers, joint ventures, you name it," said Norm Roberts, outsourcing project director at Air Canada in Montreal, which is negotiating an outsoureing eontraet with IBM Canada Ltd.

The word on the street

The rumor mill is rife with word of mating dances among other outsourcers, long-distance companies and regional telecommunications providers. Perot Systems Corp. is believed to be sending out signals, as is MCI Communications Corp.

"Client/server is inherently networking-intensive. To manage widely dispersed elient/server environments you have to have network capabilities," noted Oliver Pflug, an analyst at G2 Researeh, Inc. in Mountain View, Calif.

Money problems

EDS has been trying for years to combine forces with a telecommunications company and said it still hopes to work out a "strategic relationship" of some sort with Sprint. The failure to agree on financial terms scotched merger hopes, the companies said.

EDS' recent loss at Delta Airlines underscores its need for a partner. Delta eliminated EDS in favor of AT&T Corp. as the finalist in an outsourcing evaluation beeause EDS lacked telecommunieations clout rclative to AT&T, aeeording to Terry Quinn, an analyst at Furman Selz in New York.

Amtrak's Don Gentry *says ISSC offered better voice prices than EDS*

Whatever arrangement EDS works out with Sprint or another telecommunications vendor, its efforts will trigger a follow-the-leader scenario in which other outsourcers and teleeommunieations vendors team up, predicted Susan Serupski, editor of "InfoServer," a newsletter in Barnegat, N.J.

"It would take somebody like EDS to take the

Outsourcers, *page 89*

Software-based virtual LANs raise questions

By Steve Moore

Users are adopting a wait-and-see attitude toward emerging virtual LAN teehnologies. At the same time, industry analysts are warning of several potential difficulties that pioneer virtual LAN users may faee, ineluding uncertainty about how virtual LANs will affeet existing router networks.

A virtual LAN is a software-defined LAN segment. It ineludes an arbitrarily seleeted group of users who may be geographically dispersed and who are not necessarily attached to the same physical wiring. Most of the virtual LAN offerings are still promises at this point. Vendors elosest to delivering "true" support today include Cabletron Systems, Ine. and the Adaptive division of Network Equipment Teehnologies, Inc. Others who say they will offer virtual LAN support include 3Com Corp., Synernetics, Inc., Chipcom Corp., Ungermann-Bass, Inc., Cisco Systems, Inc., SynOptics Communications, Inc. and Fore Systems, Inc.

Rene Malones, network administrator at Comsys Technical Services, Inc. in Roekville, Md., said he is evaluating switched LANs but is not looking at virtual LAN wares because they are relatively immature. Still, he said, he is keeping an eye on virtual LAN developments.

"I think virtual LANs are the future for us because right now if we want to move some users downstairs we have to physieally get all this wiring back and forth," Malones said. "But with a virtual LAN, it's all software-driven, and we can just reroute traffic downstairs."

Vendors, for their part, tout the benefits of virtual LANs, which they say make it easier to manage LANs. Other benefits are the ability to ereate flexible virtual workgroups and accomplish moves, adds and ehanges.

Easier or not?

Still, some observers are skeptieal. "Vendors have their work cut out for them to eonvinee users that virtual LANs are not inherently more diffieult to manage than traditional shared LANs," said John Morency, principal consultant at Strategie Networks Consulting, Ine.

For example, he said, most software drivers for Novell, Ine. NetWare assoeiate LAN membership with an upper-layer protocol staek. So a eustomer will have multiple LANs for each link. "That's going to really screw up the driver software," he said. "The vendors need to make the network drivers virtual LAN-aware."

Others question the impaet on existing router networks. "When you redefine your virtual LANs in your hub, imagine what happens to your carefully thought-out IP addressing seheme and subnet maps," said Dave Passmore, principal consultant at Decisis, Inc. in Herndon, Va. "It's like you've pulled the rug out from under the routers because you've redefined the underlying LANs they're interconnecting."

Messy beginning

Further, customers may be confused by the upcoming virtual LAN explosion. "In the long run, I think the way to distinguish one virtual LAN concept from another is to determine how many traditional routers are left when you've deployed virtual LANs on a large, complex campus," said Peter Sevcik, a prineipal eonsultant at Northeast Consulting Resources, Inc. in Boston. "In some cases all the routers are still there; in some cases a handful of routers are still there; and in some cases all the routers are gone," he said.

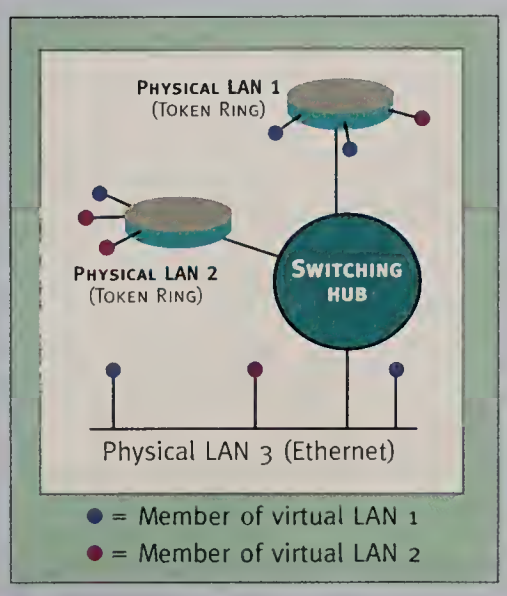
From the customer's perspective, the last eategory would be the most preferable. It would make networks significantly eheaper and easier to manage, yet the complete routing function would still be there.

The first crop of virtual LAN systems will limit individual users to membership in only one virtual LAN. Future systems promise to enable users to be members of multiple, overlapping virtual LANs — but that may compound users' network management problems. "With overlapping virtual LANs, how is a LAN analyzer going to know whieh virtual LAN to look at?" Morency asked.

Virtual LANs may require attitudinal adjustments on the part of network managers accustomed to hands-on LAN management. "Once the teehnoids learn something, they hate the idea of somebody taking their toy, turning it into an automatic transmission and putting it under the hood so the stick shift is gone," Sevcik said.

Down the road, the virtual LAN eoneept may "evolve into something different when people start getting their own private Ethernet or Token Ring LANs," Passmore said. At that point, he said, the LAN becomes a dedicated media. "Then you don't really have virtual LANs any more because everybody has their own LAN," he added.

Virtual LAN explainer



A virtual LAN differs from traditional shared-media Ethernet and Token Ring LANs in how it works.

With a traditional LAN, the physical topology of the network eorresponds exactly with the logical topology. In other words, each user's eomputer is both physically attaehed to and logieally associated with the same LAN.

In a virtual LAN, switching is used to allow users to share the same logical LAN even if their computers are attached to separate physical LANs.

In the illustration at left, users on three different physical LANs interconnected by a switching hub are logically associated with two different virtual LANs.

This deeoupling of logical network addresses from physical network deviees is generally done with software-controlled port switching, segment switching or Asynehronous Transfer Mode switehing.

— Steve Moore

Commentary

Stan Schatt

Artisoft finds its niche

Remember the stories about German Field Marshal Erwin Rommel, the "Desert Fox" who scored victory after victory during World War II, despite being outmanned? We're seeing a more modern version of this tale in the case of Tucson, Ariz.-based Artisoft, whose President and CEO Will Keiper is clearly today's Desert Fox.

When he took over Artisoft slightly more than a year ago, the company was reeling. Microsoft's Windows for Workgroups was eating into Artisoft's LANtastic market share, while profit margins were dropping; hardware sales were also dropping. A product that would add voice technology to Artisoft's product mix was greeted with skepticism by both industry analysts and the public. Chairman and CEO Jack Schoof was fired and replaced by Keiper.

How do you fight a two-front war against formidable foes such as Novell and Microsoft? How can you keep these giants from cutting into your turf and avoid heavy customer casualties? At the same time, how do you keep producing cutting-edge technology when your budget is much smaller than your opposition's?

Keiper's strategy has resulted in a licensing agreement with Novell, as well as a very significant acquisition. After years of fighting Novell, Artisoft surprised many by licensing the NetWare 4.x engine and Novell's NetWare Core Protocol. This is one of the least understood and most significant agreements announced so far this year. Novell gains a revenue stream. Artisoft gains a market.

For the past few years, Novell has not been developing new products for the NetWare 2.x market, which exceeds 1 million nodes. Now, Artisoft can offer these users a network operating system that can read NetWare 2.x files. These customers will eventually have the ability to hot key from peer-to-peer to server-based mode and manage both networks from a single console. Because such a high percentage of Artisoft's best value-added resellers (VAR) also happen to be NetWare VARs, Artisoft already has the channel to sell add-on products to the NetWare 2.x installed base.

What does licensing NetWare mean, particularly to a network manager with a LAN running NetWare 3.x? This month, Artisoft announced its CorStream Server, a product that is built on the NetWare 4.x platform. Consider the plight of a network manager who is in the process of linking several branch offices to the corporate LAN running NetWare 3.x. Novell's solution consists of a NetWare 3.x license, multiprotocol router software and a wide-area network card. The CorStream Server with an Artisoft/Eagle Technology hub card and Novell's Multiprotocol Router software is a more attractively priced package and promises absolute interoperability with the LAN at headquarters.

To make life easier ...

Given the lack of computer sophistication at most branch offices, there is another plus to the Artisoft solution. CorStream Server offers the same friendly user interface found in LANtastic 6.0 and does not require a local network administrator. Branch office users can run LANtastic 6.0 and access the server as peer users. The result is a nice marriage of server-based network operating system security and reliability and peer-to-peer usability. Because so many Artisoft resellers are also Novell resellers, it is likely that a company will have a single number to call for support. How's that for making a network manager's life easier?

Artisoft's acquisition of Eagle Technology also struck some as a ho-hum marriage of two network interface card vendors. A closer look at this venture reveals that it should provide enormous benefits.

Artisoft now becomes a major force (No. 4) in the network interface card market. Artisoft network interface cards tend to be found on small LANs — only 12% of those LANs contain more than 100 nodes. Conversely, almost half of all LANs where Eagle Technology cards dominate contain more than 100 nodes. My research reveals very little VAR overlap, so Artisoft's purchase also bought it much wider distribution. Finally, the acquisition means Artisoft is no longer perceived as a one-product company.

What went unnoticed by many is that Eagle Technology has a WAN interface card that has received excellent reviews. Now, let's return to the branch office we were discussing. The use of Eagle Technology WAN cards at corporate headquarters and the branch office means the network manager still has only one reseller to call if there's a problem.

I'm not sure how long the modern day Desert Fox can keep outthinking and outmaneuvering the opposition. I do know that I see a real change within the company. The only victim has been a sacrificial lamb (a ram, actually). The company has dropped its "road kill" series of ads in favor of a more professional approach.

Schatt is a LAN service director at Computer Intelligence/InfoCorp in La Jolla, Calif.

Japan prepares to lay fiber network nationwide

By Rob Guth
TOKYO

Japan's Ministry of Post and Telecommunications recently outlined an ambitious three-part plan for a national fiber-optic network to support broadband interactive services and link all Japanese by the year 2010.

By the end of the decade, core optical cable will be in place among all prefectural capitals, with schools, hospitals and other public institutions hooked up as well, according to the plan.

By 2005, the second stage will be complete, with 60% of the population and all cities with more than 100,000 people connected.

The final expansion period will be complete by 2010, with 100% of the population covered.

Hefty price tag

The cost of the project is estimated to be 33 trillion yen ($314 billion U.S.) for each business location to have its own fiber-optic line and for households to share lines. The figure jumps to 53 trillion yen ($504 billion U.S.) if households are given their own lines.

The ministry plans to use the network's multimedia capability to overcome pressing social problems, including an aging population and crowded cities, by facilitating interactive medical care and encouraging satellite or branch offices.

The plan leaves the creation of the infrastructure and most network applications to the private sector, said Kan'ichiro Aritomi, director of the poliey division at the ministry.

Telecommunications carriers and cable television operators will compete for the business of connecting users, the report stated.

The government, for its part, will offer tax incentives to encourage underground installation and financial support in the preliminary stages of setting up a subscriber network. It will also develop public and advanced private applications.

On a broader scale, the government will see that the interests of consumers are met by minimizing problems resulting from geographical and usage differences.

"If the building of the subscriber network is left in the hands of the private sector, there will be a lack of equity," Aritomi said.

Guth is the Tokyo correspondent at the IDG News Service.

Networks aimed at branch sites

3Com, Novell support each other's protocols

By Elisabeth Horwitt

3Com Corp. and Novell, Inc. recently announced more pieces of their partnership, which will provide interoperability and manageability across their respective networking products.

The principal target for this integration is branch offices, where users want network installations that are easy to set up and that can be managed from a centralized site, vendor spokesmen said. Indeed, Novell is the first systems vendor to license 3Com's Boundary Routing, a simplified routing protocol for smaller branch office routers.

3Com confirmed that it will support Novell's NetWare Link Services Protocol (NLSP) by year's end. This will ensure interoperability between Novell servers and routers and 3Com's NetBuilder family of bridges and routers, the vendors said.

NLSP is a Novell protocol that is said to simplify communications among routers. It helps them update one another about the addresses of network nodes without flooding the internetwork with messages, according to Novell.

On the manageability side, 3Com announced that its Transcend network management system will run as an application under Novell's NetWare Management System (NMS) 2.0, enabling NMS users to collect network alerts and statistics from 3Com hubs and routers. Network administrators at the NMS Windows console will be able to discover where 3Com adapters and hubs are located in branch offices and plot their location on the NMS topological map, a Novell spokesman said.

Mutual interests

The 3Com/Novell alliance is a potentially fruitful one, given that the two vendors share a large number of customers, according to a recent news analysis by The Burton Group, a Salt Lake City consultancy.

However, the alliance is far from exclusive: Virtually all of the leading router vendors have announced plans to support NLSP. In addition, SynOptics Communications, Inc. has integrated its Optivity network management system with NMS.

3Com also said it will incorporate Novell's Virtual Loadable Module (VLM) technology in its Autolink program, which was designed to automate configuration of 3Com adapters. VLM, introduced with NetWare 4.0, specifies how DOS and Windows clients access NetWare services over the network.

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McAfee acquisitions make it LAN management player

By Elisabeth Horwitt

■ McAfee Associates has joined the likes of IBM, Intel Corp. and Symantec Corp. in a race to provide users with a comprehensive, integrated set of PC LAN systems management applications.

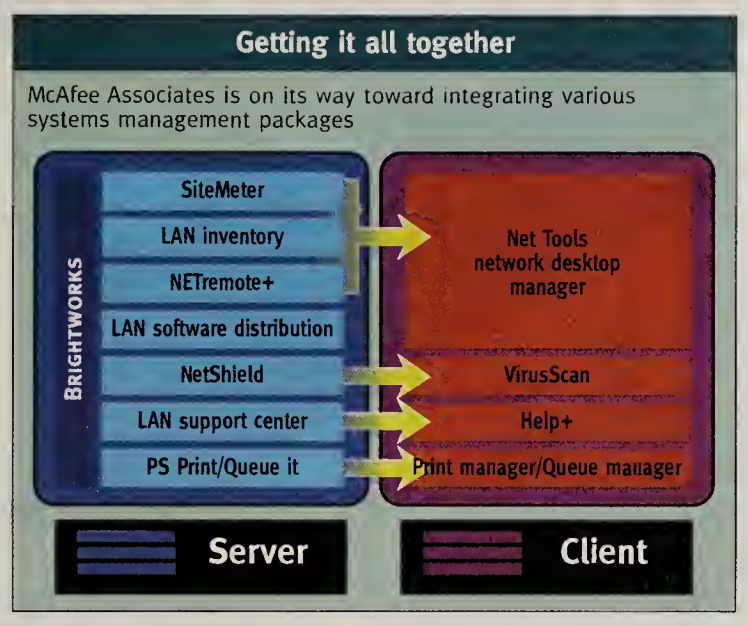
After starting out as a vendor of virus protection software, McAfee has been aggressively expanding its repertoire, primarily through acquisitions. The Santa Clara, Calif., company recently finalized its purchase of Brightwork Development Corp., whose Fusion server-based management applieations include license metering, inventory management, software distribution and help desk functions.

Rounding out its product line on the client management side, McAfee recently purchased the Net Tools and Help+ product lines from Automated Design Systems, Inc. Net Tools provides centralized management of Windows systems, including coordination of user access rights to data, applications and servers. Help+ provides views into Windows client configurations for the help desk manager.

What the customer wants

With the above products, which support Novell, Ine.'s NetWare and Microsoft Corp.'s LAN Manager environments, McAfee is well on its way to providing the kind of comprehensive, one-stop LAN systems management that customers are looking for, said Rick Villars, a director at International Data Corp. (IDC), a Framingham, Mass., consultancy.

More important, however, is the next step of integrating the disparate applications under a single graphical user interface-based console, Villars said. Network administrators want to launch different applications from the same set of Windows and have those applications share data. This would allow customers, for example, to have PC LAN configuration information collected by the inventory package available to the trouble-shooting and security packages.



McAfee plans within nine months to have integration across its management packages, particularly on the inventory management side, said Bill Larson, president and chief executive officer. For example, client agents will automatically report software updates to the help desk package.

This level of integration, combined with a comprehensive set of management packages from one vendor, is just what Alexander & Alexander Consulting Group, Inc., is looking for, said Joe Steele, a network administrator at the Lyndhurst, N.J., insurance brokerage and human resources company. "Access management is becoming more of an issue for us as we go toward a more Windows-based environment."

Keeping track

The consulting firm has been using Brightworks Fusion for software distribution and inventory management and to monitor "who is using what application and what is being tied up during certain hours," Steele said. The monitoring software gives administrators a sense of what additional software is needed and what applications might be causing a backup or slowdown of the network at a given time, he added.

Alexander & Alexander is eager to see McAfee fulfill its promise to integrate Brightworks Fusion with troubleshooting and trouble-ticketing and have all of the functions available on the help desk, Steele said.

The vendor is also working on expanding its virus protection and security software beyond client management to controlling remote access from mobile systems, Larson said.

Playing with the big guns

In addition, McAfee is integrating its systems so they can hand up alerts and other information to enterprise management platforms, such as IBM's NetView/6000 and Hewlett-Packard Co.'s OpenView, Larson said. The existing software can already interface with Novell's NetWare Management System and Microsoft's Hermes, now called Systems Management Server, he added.

McAfee is also planning next year to support key standards such as Simple Network Management Protocol and the Desktop Management Task Force's Desktop Management Interface. Support of database standards is also in the works.

One of McAfee's competitive edges is a broad customer base generated by its virus protection software, which took 67% of the market last year, according to IDC. The vendor also has a unique distribution system: Its software is available on all the main bulletin boards, with unlimited free sampling; customers pay on the honor system, Larson said. Included in the price is technical support and updates for two years.

Outsourcers

CONTINUED FROM PAGE 85

first step and set other alliances in motion," Scrupski said.

Telecommunications companies are expected to drive these alliances as much as outsourcers are. AT&T, for instance, is talking with Digital Equipment Corp. about purchasing Digital's outsourcing business.

There is precedent for such pairings. SHL Systemhouse, Inc. picked up substantial telecommunications wherewithal last fall when it signed up customer Canada Post Corp. [CW, Nov. 8, 1993]. As part of that deal, SHL acquired Canada Post's extensive nationwide private network, ineluding frame relay, X.25 packet and T1 and T3 technology, which it will use to service other customers.

Global data and voice networking firm Advantis helped ISSC win a 10-year, $509 million outsourcing deal with Amtrak.

In 1992, IBM's Integrated Systems Solutions Corp. outsoureing subsidiary formed a joint venture with Sears Roebuek and Co. called Advantis, a global data and voice networking company that drew on Sears' teleeommunieations infrastructure as mueh as IBM's.

Advantis has helped ISSC win contracts. As part of Amtrak's 10-year, $509 million comprehensive outsourcing deal with ISSC, the Washington-based passenger railway is handing over control of its voice services, including toll-free passenger lines and a private nationwide office-to-office service, to Advantis.

The railway will allow its voice contract with AT&T to expire at the end of this year, according to Don Gentry, Amtrak's vice president of information systems.

Volume discounts

Gentry said EDS was among the bidders for the Amtrak job and that EDS had teamed with AT&T to offer telecommunications services. But according to Gentry, Advantis was able to offer a lower price than EDS because it resells services from all the major carriers, from which it receives steep price breaks.

"They're able to lump our service in with others and get a better diseount," Gentry said.

Air Canada will also be using Advantis services once it finalizes its outsoureing deal with IBM's Canadian subsidiary. Like Amtrak, it also evaluated and eliminated EDS. While teleeommunications serviees was not the driving faetor in the decision, EDS came up short on that count, Roberts noted.

"In the data area, they were quite capable. In the voiee area, I believe they have a ways to go," he said.

Perhaps the staunchest reminder comes from Delta. In eliminating EDS, the airline narrowed its finalist list down to one vendor: AT&T.

Briefs

Cisco's good fortune

Cisco Systems, Inc. continued the streak of profitability it has enjoyed since going public in 1990. The San Jose, Calif., company announced net income of $84.3 million or 32 cents per share for the third quarter, compared with $46.3 million or 18 cents per share for the same period last year. Earnings reflect a two-for-one stock split, effective March 4.

Licensing deal

Chipcom Corp. has announced a technology agreement with **Epilogue Technology Corp.** under whieh it will license Epilogue's portable Simple Network Management Protocol (SNMP) software, called Envoy, and management information base compiler. Chipcom said it will use these components to support the extended management capabilities of SNMP Version 2 in its line of intelligent switching hubs.

Novell puts on Tuxedo

Novell, Inc. last week announced the Tuxedo Master Program, which will provide training, support and marketing programs to help Novell channel partners and technology providers sell and support the vendor's on-line transaction processing system.

Message the famous

Computer users can give luminaries a piece of their mind via electronic mail with the help of *E-mail Addresses of the Rich and Famous*, a new book published by Addison Wesley Publishing Co. The book lists the addresses of 1,000 celebrities such as Tom Brokaw, Ross Perot and actors Ed Asner and James Woods.

Messaging guide

The Electronic Messaging Association, a 400-member user and vendor trade group in Arlington, Va., has released a guide to messaging products and services. The guide costs $20 for members and $40 for nonmembers.

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New Products

Telecommunications Techniques Corp. has introduced the Fireberd 500, a modular internetwork analyzer; and a Frame Relay option for the Fireberd 6000, the company's multifunction communications analyzer.

According to the Germantown, Md., company, the Fireberd 500 provides simultaneous LAN and wide-area network analysis with full data and T1 bit error rate transmission testing.

The product lets users simultaneously compare information from both sides of devices such as routers, bridges and data service units.

The Fireberd 6000 Frame Relay option enables users to test high-speed data networks carrying frame relay, a wide-area switching technology.

Features include complete frame relay testing and troubleshooting, quality assessment of transmission facilities, verification of end-to-end continuity as well as the performance of network stress tests.

Prices for the Fireberd 500 range from $15,000 to $55,000; the Fireberd 6000 with Frame Relay option ranges from $2,495 to $6,700.

▶ *Telecommunications Techniques*
(301) 353-1550

RAD Data Communications, Inc. has introduced the RH-300, an access and monitoring system that lets network managers get real-time statistics and automatic alarms.

According to the Mahwah, N.J., company, the product, when coupled with the RC-100WL protocol analyzer, enables any link in a network to be instantly accessed for monitoring and testing.

Features include access to multiple interfaces, dual-monitor buses and the capability to monitor up to 1,024 links from a remote site.

The RH-300 fits in standard wiring closets and costs $250 per port.

▶ *RAD Data Communications*
(201) 529-1100

Nupon Computing Corp. has introduced the LTS Communications Server series, a family of multiprotocol dial-up routers that also act as terminal/print servers.

According to the Tustin, Calif., company, the devices feature remote access capability to LANs and the ability to service terminals, printers and modems.

The servers can be configured with two or three protocols, have dual-processor architecture, use flash read-only memory for easy software upgrading and support flash memory PCMCIA cards.

LTS Communications Servers cost from $1,695 for a four-port unit to $2,995 for a 16-port unit.

▶ *Nupon Computing*
(714) 258-8622

Rupp Technology Corp. has introduced WinLynx, a PC-to-PC file transfer utility software program.

According to the Phoenix company, the product allows users to move and manage files between connected PCs while remaining in and using Window.

Features include extensive drive and directory synchronization options, advanced resource sharing, in-background file transfers and added file and disk management capabilities.

WinLynx costs $169.

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IBM's AS/400 earns some respect

Revamped line addresses problems, but some features lag

By Craig Stedman

Long saddled with a Rodney Dangerfield-like image that helped fuel doubts about its future, the AS/400 may finally get both some respeet and the last laugh — provided IBM's client/server aet eomes together fast enough to keep users from ealling for an off-stage hook.

While most proprietary minicomputers are fading or have already dropped off the map, IBM is trying to take the AS/400 and its 250,000-plus installations into the heart of the open systems and client/server worlds via a complete overhaul of the 6-year-old machine.

closer LOOK AS/400

In May, IBM introdueed a bumper crop of revamped hardwarc and software aimed at making the AS/400 more Unix-like. Included were new versions of the OS/400 operating system, its integrated database and the AS/400's PC connectivity software; a faster TCP/IP implementation; a 486-based file server board; and 14 models that will support in-cabinet upgrades to PowerPC-based systems due out next year.

The ambitious product plans are getting positive reviews from most users and industry analysts. Melding client/server capabilities and support for Unix application programming interfaees (API) with the AS/400's integrated platform and systems managemcnt tools is an appealing idea, they said.

Riding the wave

"We're very encouraged, and our plan is to follow the platform as it migrates toward more openness. We'll kind of ride the wave here," said Mare Smith, direetor of information services at Mallinckrodt Medical, Inc., which makes pharmaceuticals and other medical products in St. Louis.

"When IBM told me the AS/400 was open, I had to ehuckle a bit," added Mare Novik, direetor of information systems at HealthInfusion, Ine., a Miami supplier of intravenous medicine for at-home patients. "But they've made some significant strides, and I think they have a good strategy."

However, OS/400 Version 3 and the renamed DB2/400 database are not scheduled to ship in volume until late this year, and analysts said the transition of the AS/400 will not be complete until the 64-bit PowerPC hardware beeomes available in mid-1995. Support for running other operating system personalities alongside OS/400 will follow in 1996, according to IBM.

Some users bemoan the wait. "The future is just not getting here fast enough for us," said Jeff Harris, direetor of IS at the Mannington Carpets division of Mannington Mills, Ine. in Calhoun, Ga. "IBM is talking 1995 and 1996, and they're being realistic, but the customer is crying out for it today."

Tight schedule

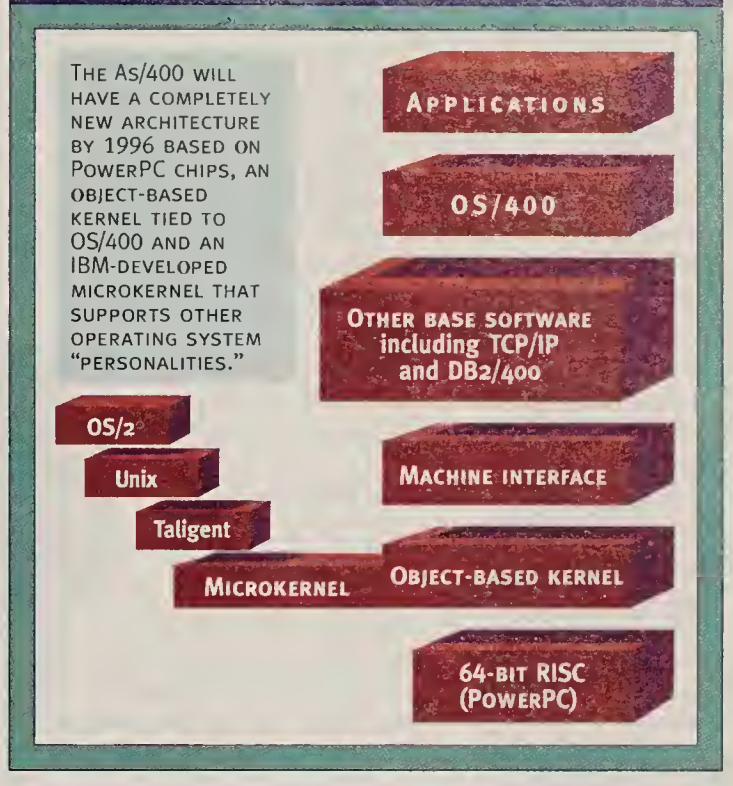
IBM is "really pushing the envelope in terms of timing" and cannot afford much in the way of schedule slippage, added Riehard Patton, vice president of research and development at Lawson Software, a Minneapolis software vendor. "If this could have been done a year earlier, it would have been better."

Nonetheless, IBM has "the best strategy I've seen for taking a proprietary system and moving it into the open systems world," Patton said.

Other industry observers agreed, but there is still some skepticism about whether users outside the large AS/400 installed base will be open to IBM's piteh.

AS/400, *page 98*

A new look under the hood



DG plans turnaround as customers buy into strategy

By Mary Brandel

It seems, at first, an odd pair. Paigenet, Inc. — the largest paging company in the U.S., which has grown at a 40% to 50% clip since it was established 12 years ago — and Data General Corp., whose head count has shrunk to less than two-thirds the size it was during its 1991 heyday.

But the two companies say it is a perfeet match. Paigenet reeently signed a eontract to purehase $7 million worth — and likely up to $15 million, aeeording to Paigenet — of high-end DG Aviion servers to replace 110 Motorola, Inc. 8640 servers. They will be used to support its 24-hour pager-activation serviee.

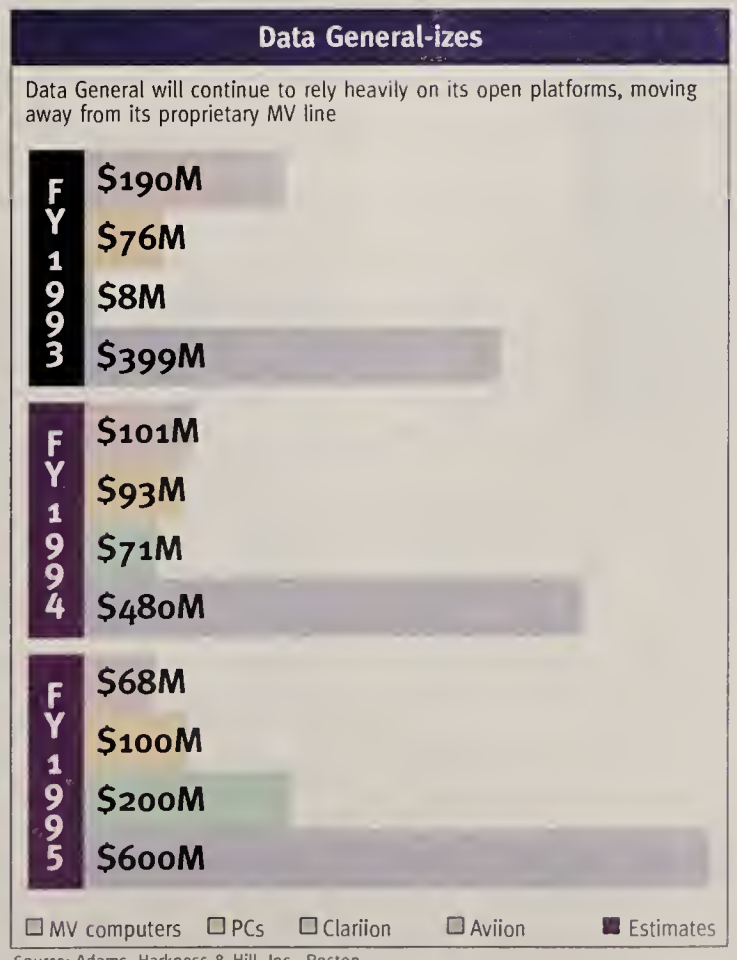
In the last two months, three other organizations have signed deals with DG: the Quorum Health Group in Nashville ($2 million), the University of Southern California (USC) ($1 million) and the U.S. Naval Aeademy ($5 million).

The former minieomputer eompany is not out of the woods yet. But according to customers and analysts, it has hit a good stride toward a turnaround. Customers are finding reasons to choose DG wares over mueh larger rival Hewlett-Packard Co. And investors are looking to early to mid-1995 for profitability.

Ironically, much of Paigenet's decision rested on what are commonly seen as DG's weaknesses — finaneial instability and a relianee on a chip widely seen as behind the teehnologieal curve (see story page 96). DG bases its systems on Motorola's 88110 ehip, as opposed to Intel Corp.'s Pentium or IBM/Motorola's PowerPC.

Data General-izes

Data General will continue to rely heavily on its open platforms, moving away from its proprietary MV line



Source: Adams, Harkness & Hill, Inc., Boston

But Paigenet diseovered that ehip changes can be costly. When it considered upgrading to higher-powered Motorola servers, it was told it would also have to ehange its operating system. "Motorola's strategy was to take us from [System V Release 3] to SVR4 and then to PowerOpen over a eouple of years," said Kevin Broadway, viee president of information systems at Paigenet. "It's just a huge investment and with no improvement to user funetionality — nothing."

Operating system stability

In eontrast, "DG/UX is my guarantee that if they make a chip ehange, I don't have to make an operating system change," Broadway said. DG is telling its customers that they will have "backwards compatibility, no matter what ehip they run on."

Seeond, Broadway said, "Our [chief financial offieer] understands where they're going from the finaneial side of things.... It's a clear story to us and our senior management here."

Other customers coneur. "Everyone was a little concerned about the financial difficulties," said Lou Ramirez, associate director of hardware facilities and networks at USC, which is starting to replace its Prime Computer, Inc. minicomputers with Aviion servers. "But the management support we received and the technology they had to offer is very good."

Data General, *page 96*

Banks evolve to meet changing needs

Pilot project serves up traveler's checks through teller machines

By Julia King

Responding to consumer demand for a faster, easier way to buy traveler's checks, American Express Traveler's Cheques Group is teaming up with banks to offer its checks through specially outfitted automated teller machines (ATMs). The ATMs incorporate new bar-code technology jointly developed by American Express Co., Diebold, Inc. and Electronic Data Systems Corp.

Comerica Bank in Dallas is the first bank to test market the new ATMs, which have cut the typical transaction time from 10 to 15 minutes to a little more than one minute, according to Jeffrey Roesler, assistant vice president of electronic banking. Checks dispensed by Comerica-based ATMs will cost the same as those purchased from a teller, but during the test period, Comerica is offering the checks free of charge.

"The biggest benefit to the customer is that it's a lot quicker. So far, customers who have used the machine have reacted favorably," Roesler said.

Comerica is currently offering the traveler's checks through a dedicated ATM. Eventually, the service will be incorporated into the bank's installed base of ATMs, which Comerica, like all banks, is looking to diversify. Comerica is also considering selling postage stamps from its ATMs.

Neither Amex nor Diebold, which sells the ATM boxes, had an exact price for retrofitting existing ATMs to handle traveler's checks transactions. Upgrading involves installing bar-code scanning technology in the ATMs that costs about $20,000 new, according to a Diebold spokesman.

The bar-code scanner captures and records the serial numbers printed on the back of each traveler's check. These numbers are then transmitted to Amex by EDS' ATM processing system.

Amex said the San Antonio Federal Credit Union in Texas is also scheduled to test the new technology later this month. A national rollout of full-service ATMs is planned for later this summer. By year's end, Amex estimates that 200 bank-based ATMs will be in operation. It also plans to place the ATMs in shopping malls, airports and other locations.

First of America leverages technology to improve service

By Thomas Hoffman

In a move that reflects a popular trend in the banking industry, First of America Bank Corp. has automated customer service operations at more than 90% of its 550 Midwestern branches in an attempt to make its branch staffers more sales-driven.

The net effect of these cultural changes at First of America has been impressive. For example, the bank's ability to sell multiple products to one customer has risen from 30% to more than 100% in some cases, said Bob Stone, vice president of retail delivery systems at the $20 billion (in assets) institution.

Banking pundits said First of America's efforts mirror similar moves by other commercial banks that have been using technology to "humanize" their retail banking services. The industry has been trying to regain control of a customer base that has steadily been drawing its investments out of bank accounts and into higher-yielding, non-bank portfolios such as mutual funds.

"What's happening is that those functions are becoming much more highly automated," said David Medeiros, an analyst at The Tower Group, a Wellesley, Mass., banking and financial services consultancy. Medeiros said many banks have begun automating their branch platform operations, such as savings account openings, to make their branches more efficient.

Face-to-face contact

In turn, branch managers and loan officers have more time to sell products and services to customers. And these days, face-to-face contact with clients is one of the few differentiators banks can offer that most mutual funds providers cannot, Medeiros said.

First of America recognized the need to automate its customer service and teller systems in 1986. "We were trying to change our culture from service-only to service and sales," Stone said. In 1988, the Kalamazoo, Mich.-based bank holding company entertained bids to automate its platform operations from vendors such as IBM and the former NCR Corp. Stone said First of America chose NCR because of what he called its leading-edge approach to open systems.

"Six years ago, Unix was almost unheard of in commercial business," Stone said. "But what appeared to be a risky proposition then is pretty mainstream today."

In late 1988, First of America began installing NCR Tower machines and Intel Corp. 80386-based workstations at 20 of its branches to support the DOS-based platform software that NCR designed for the bank's client workstations. First of America has since rolled out 3,000 to 4,000 386 and I486 workstations to its Midwestern branches. Stone said the bank is replacing 180 Motorola, Inc. 68000-based Tower machines with Pentium-based System 3333 servers from AT&T Global Information Solutions (formerly NCR), all of which will be installed in the next 90 days.

VP Bob Stone: *First of America recognized the need to automate services*

To date, First of America has invested approximately $20 million in its teller- and platform-automation initiatives.

The bank is also rewriting its customer service applications using Cross Sell Manager from Berman Technologies Corp. in Charlottesville, Va. Stone said the bank is using the development kit, which includes a screen painter and a data dictionary, to add functionality to its customer service applications. It expects that project to be complete by year's end.

A retraining program for customer service representatives is part of the initiative, Stone added. "We basically restructured the entire sales presentation process so that products are presented to customers based on their needs," he said.

For example, bank customers in urban settings typically have different investment requirements than their peers in smaller communities. First of America took these factors into consideration when it re-engineered its product presentation processes, Stone said.

Data General

CONTINUED FROM PAGE 95

Paigenet and other DG customers also said DG's products are well-engineered and well-priced, particularly Clariion, DG's redundant arrays of inexpensive disks-based storage subsystem. "They provided high availability, and that's critical for us," Ramirez said.

According to DG, 70% of Aviion servers ship with Clariion, and storage often accounts for 50% to 60% of the purchase order. DG is also trying to sell Clariion to non-DG shops. "We will see a move to build up a stronger separation between the Clariion business unit and the rest of the company," said Bob Sakakeeney, an analyst at Aberdeen Group in Boston.

Aviion is also seen as a top Unix symmetrical multiprocessing performer. "Their Unix blows away HP, IBM and Sun," said Jonathan Eunice, an analyst at Illuminata in Hollis, N.H. "They've got very few people doing high bang for the buck with the products."

In fact, a key factor for DG's expected return to profitability is its straightforward approach to internal cost cutting. Its third-quarter financial report included a lay off announcement, bringing the company's staff size to about 5,500.

Its pragmatic approach also includes what analysts call an unwavering focus on large commercial customers with high-availability, large transaction-oriented applications that need to be up and running 24 hours a day, seven days a week. For instance, DG's systems integration unit, newly formed in January, focuses only on DG systems, not beyond.

"They see themselves as a lower-level integrator of hardware components and system software, knowing that's where their strengths are for the next three to five years," Broadway said.

But how far can DG go? "I don't see the days of 20%, 30%, 40% growth happening anymore," Sakakeeney said. "They'll have a nice modest profit growth."

Some doubts linger

Some customers are not so comfortable with DG's financial troubles and the fact that its systems are based on the Motorola 88110 chip. Many observers say the 88000 chip family is a dead end because Motorola has focused its attention on the PowerPC.

"I don't think they're up to the technical standards that they should be," said Todd Kerin, corporate treasurer at HA Holden, Inc., an electronic motor repair distributor in Minneapolis that is currently using a DG MV15000 system. "We're considering a move [to Unix] in the next 24 months, and DG is not very high on my list."

Kerin said his decision was based partly on the chip issue and partly because he is unhappy with DG support.

Not that DG is ignoring the chip issue. In fact, the company has ported its DG/UX operating system to at least one other chip, although DG will not specify which one — although it is not yet offering systems based on the new chip.

Still, Steve Gardner, marketing manager at DG, strongly hinted that Pentium and the PowerPC are the likely candidates. However, it will be two to three years before DG introduces a family of products on one or more of these chip sets, he said. Some analysts said the firm should make the move sooner than that.

Gardner replied, however, that the company is waiting for the new chips' price/performance curve and scalability to improve before offering anything for sale. —*Mary Brandel*

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Commentary

Shaku Atre

Paving the client/server road

In early May, IBM pulled out all the stops to relaunch the AS/400, enhancing client/server capabilities significantly and emphasizing client/server solutions.

Users want to know if this is the real thing and if these "solutions" solve anything. Or is the AS/400 relaunch mostly a marketing move to put a new label on a successful minicomputer?

IBM's latest AS/400 bid represents an important event for the client/server world, one that could help bring client/server to critical mass in the marketplace. Thus far, by default, client/server has been mostly a "build-your-own" technology with many obstacles.

I suspect that many users have been waiting for a vendor to reduce the client/server headache factor by providing ease of use, installation and operation. Why is the solutions approach intriguing? Imagine yourself as an IS director who wants to deliver those career-enhancing, order-of-magnitude benefits that client/server technology will supposedly deliver.

On the whole, decision makers find it sobering to learn that the road to client/server is not yet paved. There are three options: 1. Wait for the road to be paved. 2. Build your own off-the-road vehicle to build major applications. 3. Conduct a client/server pilot test for a fairly trivial application that won't hurt much if it fails (but won't prove much if it succeeds).

One AS/400 can handle duties in an integrated way that otherwise might require many specialized servers.

So, where does the AS/400 fit in? It represents an attempt to pave the road. In the past, many people would not have thought of the AS/400 as a client/server candidate, even though client/server features have steadily been added. It has a reputation for being slow at file serving, weak in graphical user interfaces, for being proprietary, for offering hardware that costs more than other client/server options and for having a less-than-robust database.

Solved problems

These problems were corrected with the May announcement. Two new server models, offered at competitive prices, are optimized for database serving duties; an optional file serving I/O processor boosts file serving speed by a factor of eight. One AS/400 server can handle duties in an integrated way that otherwise might require many specialized servers. Also, the AS/400 offers 2,000 client/server applications.

GUI tools, 4GLs and object-oriented development tools are offered for every major client platform: Microsoft's Windows, IBM's OS/2, Unix and Apple's System 7. Users can use many of the popular development environments, such as Powersoft's PowerBuilder, Gupta's SQLWindows and Microsoft's Visual Basic.

The "proprietary rap" is being beaten through a new operating system release that features 150 new APIs and adherence to a wealth of open system standards.

The AS/400's database, now called DB2/400, has been revamped to function as a database server with features that include triggers, referential integrity, stored procedures and two-phase commit.

SQL performance is three to five times faster than before, with selected queries running 20 times faster. TCP/IP performance and IBM's Advanced Program-to-Program Communications speed have been boosted tremendously.

These developments show that IBM took a close look at client/server requirements and set out to meet them systematically and in a way that shields users from complexity.

It's important to remember that the key to the AS/400's success since it was introduced in 1988 has been its ability to deliver sophisticated technology that is easy to use and thus requires minimal staff training (for both users and IS). The AS/400 offers 25,000 packaged applications, powerful systems management, a built-in relational database management system and an operating system that runs on all models, from desktop units to multiple-cabinet high-powered machines.

So, keep a close eye on the AS/400, especially after the new software is delivered in the middle of the fourth quarter. Let's see if IBM can pave the client/server road and keep it paved.

Atre is president of Atre Associates in Port Chester, N.Y.

AS/400

CONTINUED FROM PAGE 95

"I don't know if somebody who is a die-hard Sun workstation sort of person is ever going to raise an eyebrow" over the AS/400, said Scott Plumer, technical support project manager at Gannett Co.'s data center in Silver Spring, Md.

IBM catches some darts for undermarketing the AS/400 technology. "It's somewhat of a problem when you have a user community that's really unaware of some of the capabilities that can be exploited on the AS/400," said Taylor Moore, vice president of logistics and IS at Mannington Carpets. "I think that's one of IBM's great failings."

David Thomas, IBM vice president and general manager of the AS/400 Division, acknowledged that a recent survey showed "that 40% of our customers didn't know they had a database" in their systems. As a result, Unix systems vendors have been able to depict the AS/400 as a technical laggard.

AS/400 marketing has traditionally focused on the machine's ease of use and ownership costs, but Thomas said IBM is trying "to communicate more aggressively that this is not 1988 technology." An example of this is the new DB2/400 name, which is meant to give the database its own identity.

Until now, IBM has had a hard time playing up the AS/400's technology because it did lag behind Unix systems on many fronts, including raw speed, TCP/IP throughput and support for advanced database capabilities such as triggers and stored procedures, analysts said.

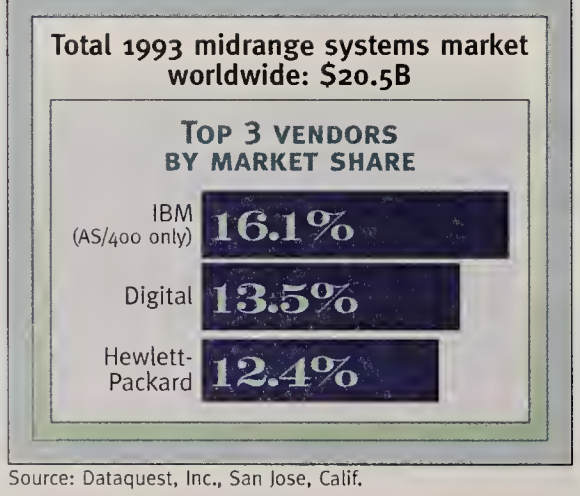
But the lines between AS/400 and Unix machines "will get more blurred" when the new software and the PowerPC-based hardware ship, said David Andrews, managing partner at D. H. Andrews Group, Inc., a consultancy in Cheshire, Conn. "Then it really becomes a question of whether you want an integrated system or a roll-your-own."

Worthwhile endeavor

IBM is trying to convince software vendors backing roll-your-own Unix that the AS/400 — and its huge installed base — would be worthwhile now that OS/400 Version 3 will support 70% of what IBM considers the key Spec 1170 Unix APIs. It also has a new file system for handling byte-stream data formats associated with Unix and PCs, as well as record-oriented AS/400 data.

Still the champ

The AS/400 remained king of the midrange hill in 1993 and is expected to hold onto that position again this year



Source: Dataquest, Inc., San Jose, Calif.

Four software vendors disclosed plans to port their Unix products to the AS/400 as part of IBM's May announcement, and IBM hopes to have 20 to 30 more companies in the fold by late this year, said Thomas Bittman, who manages the AS/400's open solutions program.

One of the first to take the plunge was Information Management Co. (IMC) in Edison, N.J., which is porting its implementation of the Tuxedo transaction monitor to the AS/400. Moving a Unix application to the AS/400 had been "almost impossible to do," but the changes to OS/400 Version 3 make it easier, said Bob Gardner, IMC's vice president of marketing and planning.

"The AS/400 is no longer standing alone," Gardner said. "If you look below the cover, it's not open. But outwardly it is open, and that's what really matters."

Users will be watching closely to see whether OS/400 Version 3 and the other new products are alluring enough to give the AS/400 the client/server boost it needs to keep from joining its proprietary brethren in decline. "This is really a make-or-break release for IBM," Harris said.

Limits remain

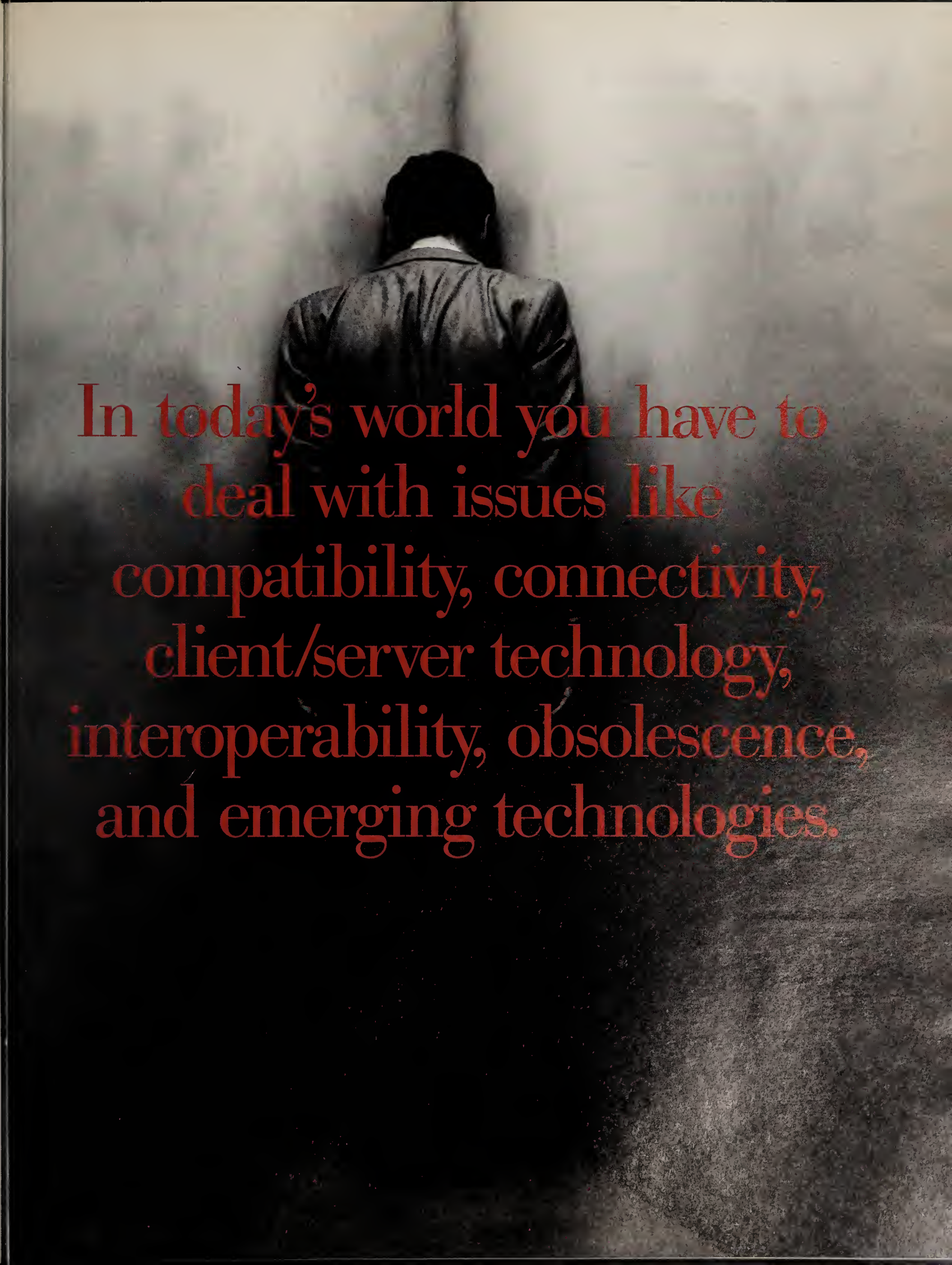
Client/server and the AS/400 are not total strangers even now, but analysts and software vendors say it will take until 1995 to get the technology in place that will free a wider range of users to embark on true client/server projects.

John Wark, vice president of marketing and development at Progress Software, Inc. in Bedford, Mass., said AS/400 versions of the company's client/server development tools account for only about 5% of sales after two years on the market. IBM's lack of a competitive TCP/IP product has been a big impediment to using the AS/400 as a server, Wark said.

Taylor Moore, vice president of logistics and IS at Mannington Carpets, said PCs also have to share data through the AS/400 rather than peer-to-peer, a shortcoming that IBM's new Client Access/400 software is supposed to address.

"What IBM has out today [for client/server on the AS/400] vs. what they're going to have out later this year is like comparing apples and oranges to me," Moore said. Until now, IBM "viewed PCs as almost terminal things" rather than separate processors, he added.

PCs typically outnumber terminals in AS/400 shops, and most users are "doing something you could call client/server," said David Andrews, managing partner at D. H. Andrews Group. But "very few" actually process at the PC level, as opposed to putting applications in a graphical user interface. — *Craig Stedman*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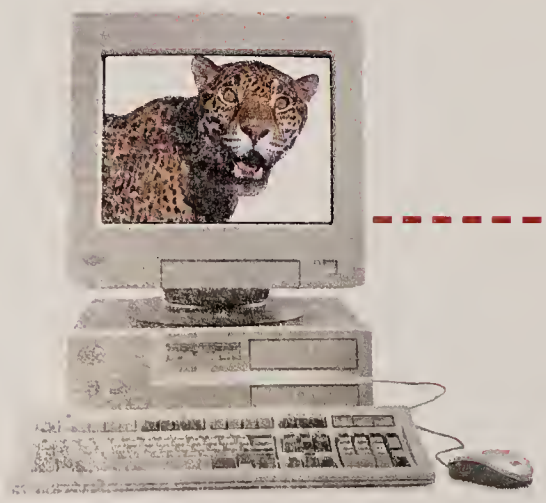

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Medical software now under doctor's care

By Thomas Hoffman
ROCHELLE PARK, N.J.

Less than three years ago, Jack Berdy was the chairman of On-Line Software International, Inc., a $100 million-plus, Fort Lee, N.J., systems software developer. These days, Berdy, 47, can be found putting in 36-hour shifts as a second-year internist at nearby Hackensack Medical Center.

On-Line, which Berdy founded in 1969, was best known for packages such as its Intertest debugging tool. After 22 years of steady growth, the company was acquired by Computer Associates International, Inc. in September 1991.

By that time, Berdy had already shifted his day-to-day responsibilities to On-Line President Bill Nelson while he was busy attending medical school at George Washington University in Washington.

"I had given medical school a lot of thought and decided the time was right," said Berdy, who, in addition to practicing internal medicine at Hackensack Medical, recently started a new software venture called Berdy Medical Systems, Inc.

Berdy Medical, which was officially launched last August, recently began marketing several health care-related software packages. Among them is the Berdy SmartCard, a portable credit card-size medical record that has already gained acceptance at more than 25 New York-area medical institutions, including Beth Israel Medical Center in New York and Stamford Hospital in Stamford, Conn.

The Berdy SmartCard gives hospital emergency departments immediate access to vital patient information to expedite processing, treatment and continuity of care for patients with multiple physicians or patients who are enrolled in managed health care plans.

This summer, the company plans to begin marketing a handheld device for doctors making hospital rounds. The device is designed to simplify patient record keeping. And even though Berdy will be somewhat distracted from his corporate endeavors during his second-year residency, he will be covered by Rick Holtmeier, president of Berdy Medical who was once a senior vice president at On-Line.

Briefs

DG adds 10 packages

Data General Corp. added 10 packages to its fixed-price services offerings, including the implementation of **Computer Associates International, Inc.**'s CA-Unicenter and **Novell, Inc.**'s NetWare 3.12. DG also announced it will now sell and support CA-Unicenter on multiple Unix and LAN platforms, including Hewlett-Packard Co., Sun Microsystems, Inc., IBM, NetWare and Microsoft Corp.'s Windows NT.

New Unisys executive

Alan G. Lutz, 48, has been named president of **Unisys Corp.**'s Computer Systems Group. Lutz, who was most recently president of Kassandra Group, a Wilmington, N.C., technology consulting firm to the telecommunications industry, replaces Hugh Lynch, who retired.

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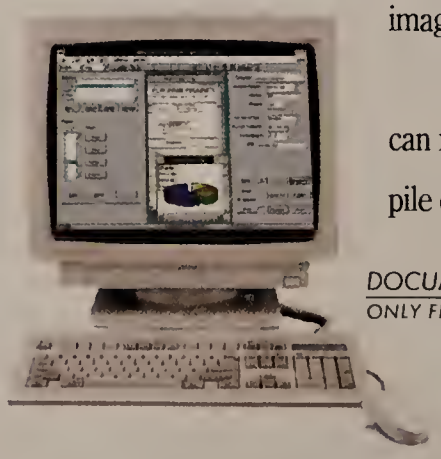

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New Products

Serena International has introduced X:Change, a cross-platform file management environment.

According to the Burlingame, Calif., company, the product was designed to meet the needs of programmers who use workstation technology to develop MVS mainframe and client/server software.

Features include a single graphical interface to manage all platforms, non-TSO access to the mainframe and identification of duplicate versions so only nonduplicate versions are transferred.

Prices range from $7,500 to $75,000 for mainframe licenses and from $75 to $150 for workstation licenses.

▶ *Serena International*
(415) 696-1800

Netwise, Inc. has announced TransAccess DB2/Integrator, a middleware tool that enables transparent access to IBM's DB2/MVS through CICS from Windows application environments.

According to the Boulder, Colo., company, the product lets users and applications access mainframe DB2 data the same way they would access any other relational database.

Features include a full range of query, update and/or modify capabilities for DB2 data; leveraging of mainframe security, managing and accounting systems; full tracing and logging facilities; and multinetwork flexibility.

TransAccess DB2/Integrator costs $48,000.

▶ *Netwise*
(303) 442-8280

BMC Software, Inc. has announced Recovery Manager, a product that allows database administrators to speed and simplify DB2 database recoveries by automating the recovery process.

According to the Houston company, Recovery Manager identifies dependent table spaces and indexes to recover, helps select a recovery point, provides detailed analysis and ensures that all related objects are recovered at the same point for consistency.

Recovery Manager allows recovery plans to be predefined so that they can be immediately implemented when a failure occurs.

Prices start at $34,000 based on CPU levels.

▶ *BMC Software*
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IPL Systems, Inc. has announced the ESP RAIDTower, a storage product that offers redundant arrays of inexpensive disks (RAID) 5 performance, with intelligent read and write cache in a single subsystem for the AS/400, open systems and PC-based servers.

According to the Maynard, Mass., company, the ESP RAIDTower can provide a maximum capacity of 13.8G bytes of high-performance storage in RAID 5 mode or 15.8G bytes in RAID 0/independent mode.

The product is available in rack-mount or tower (deskside) configurations.

Pricing starts at $20,400.

▶ *IPL Systems*
(508) 461-1000

J. D. Edwards & Co. has introduced the Workstation Order Entry system, a Windows-based client/server system.

According to the Denver company, the product allows users to enter, revise or browse sales orders in a graphical user client/server environment.

Workstation Order Entry manages sales orders, quotes, credit memos, look-ups, prices, taxation, credit checks, customer terms, complementary items and substitutions.

The system can be used in a stand-alone environment or while connected to the AS/400 server.

The Workstation Order Entry system costs $1,000.

▶ *J. D. Edwards*
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Product short

Information Builders, Inc. has introduced Focus Reporter for Windows, a client/server reporting tool used for developing complex enterprise reporting and decision applications. The product allows end users, power users and information systems professionals to build queries and design attractively formatted or graphical reports. Cost: $395. Information Builders, New York, N.Y. (212) 736-4433.

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Object standards grow

Recommendations give databases more allure

By Kim S. Nash

Would-be users afraid to buy object databases that are too quirky and different from one another may see that concern dry up by this time next year, observers said, as standards advocated by the Object Database Management Group (ODMG) are swept into product upgrades due in the next 12 months.

Object database makers, such as Servio Corp., Objectivity, Inc. and Object Design, Inc., have promised to incorporate ODMG specifications for an object query language, object definition language and bindings for the C++ and Smalltalk programming languages into new versions of their products. The goal is to take some of the risk out of buying object databases, which today are relatively vendor-specific. Adherence to so-called ODMG 93 standards should make the products more uniform.

Object databases will not be as interchangeable as New York Yankees managers, but ODMG 93 should make progress toward establishing some basic levels of compatibility between products, said Vince Jordan, vice president of technology at SHL Systemhouse, Inc.'s Object Technology Center in Boulder, Colo.

Moreover, a lack of portability between object tools and databases "keeps a lot of people from embracing objects," Jordan said.

In theory, compliance to ODMG 93 will let users port applications that they built for one ODMG 93-compliant database to other object databases that also support the standard.

Get in line

Austin, Texas-based UniSQL, Inc. last week claimed to be the first vendor to ship ODMG 93-compliant interfaces for C++ and Smalltalk.

Many voices

Only object database vendors are members of 3-year-old ODMG, although relational powerhouses Oracle Corp. and Sybase, Inc. have petitioned to join, according to several ODMG members.

The standards the group has outlined so far are largely consensus specifications and techniques drawn from existing products, said ODMG member Dirk Bartels, who is also president of Poet Software Corp. in Santa Clara, Calif.

For example, the object query language portion of ODMG 93 was derived from 2-year-old functions used by O2 Technologies, Inc. in Mountain View, Calif. But ODMG 93 is not alone in wanting to set rules for object databases.

Relational database forefathers, including Sybase and Oracle, are pushing their viewpoints via committees within the American National Standards Institute (ANSI). The ANSI group that oversees SQL — the method by which users access and manipulate data stored in relational databases — is working on object rules of its own. SQL3 is the working name of a SQL that includes object extensions but maintains relational roots.

SQL3 will be quite influential simply by virtue of the power of its backers, according to Jason Browning, a distinguished member of technical staff at AT&T Bell Laboratories in Homedel, N.J.

"Many [users] will want to stick with something that sounds relational just because that's what they're used to," Browning said. "It's a comfort factor, so

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Object of desire

As in 1993, sales of object databases are expected to double in 1994, reaching $160 million

WORLDWIDE OBJECT DATABASE MARKET

	1992 Sales	1992 Share	1993 Sales	1993 Share
Object Design, Inc.	$11M	27.5%	$20M	25.0%
Hewlett-Packard Co.	$5M	12.5%	$10M	12.5%
Objectivity, Inc.	$5M	12.5%	$6.9M	8.6%
Versant Object Technology	$5M	12.5%	$6M	7.5%
Ontos, Inc.	$4.3M	10.8%	$6M	7.5%
Servio Corp.	$4M	10.0%	$8.7M	10.9%
O2 Technologies, Inc.	$1.5M	3.8%	$7.5M	9.4%
Poet Software Corp.	*Not in business*		$2.1M	2.6%
Other	$4.2M	10.4%	$12.8M	16.0%
TOTAL	$40M		$80M	

Source: Salomon Brothers, Inc., New York

Taligent, user companies explore Unix-based visual tools

By Melinda-Carol Ballou

A little-known company called TakeFive Software GmbH, based in the provincial Austrian birthplace of Mozart, is making big strides among European corporations. Closer to home, Taligent, Inc. is bundling TakeFive's visual programming environment in its application environment.

TakeFive, based in Salzburg, earlier this month opened its first U.S. office in Cupertino, Calif., to sell its Sniff+ tool set. So far, the company's major customers are several dozen European firms.

Features that differentiate Sniff+ include support for multiple Unix compilers and debuggers, multiple languages (currently C and C++) and the ability to perform partial parsing of code, according to several developers.

"Most class browsers are very tightly coupled to their development environment. For instance, if you look at Energize from Lucid or Object Center from Centerline, they're all linked very tightly with their compilers," said Christian Marcotte, software architect at Bell Northern Research Ltd.'s research and development division in Ottawa.

For organizations with millions of lines of code, the high performance of a special "fuzzy parser" technology that reads through code and recognizes symbols, rather than compiling the source code, can be extremely useful (see chart below).

"A full compile takes a lot of time — a million lines of code can take 10 hours on a [Sun Microsystems, Inc.] SPARC machine," Marcotte said. "Sniff+ can extract information for 50,000 lines of C++ code on a SPARC 2 in 35 seconds because it doesn't do a full parsing."

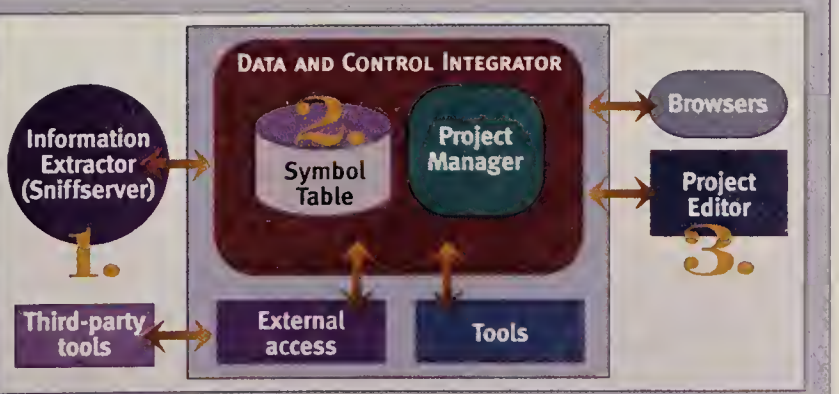
According to Michael Greminger, a software engineer at Credit Suisse, a financial institution in Zurich, ease of use in the often arcane world of Unix development is part of why Sniff+ has become a main development environment for his group.

"It's very easy and handy ... you click on something, and you get exactly what you're interested in," Greminger said. "The ability to mix and match platforms and compilers is an advantage."

Sniff+ architecture

Sniff+ offers visual tools that ease the development process across multiple Unix compilers, platforms and languages

1. The Information Extractor reads code, partially parses it and then transmits symbols to a table. Symbols represent how software classes and variables are defined.
2. The Symbol Table acts as a repository for software data and is accessible by Sniff+ tools.
3. The Project Editor lets developers define and maintain structure for projects. Data is stored in the Project Manager.



How it works

Sniff+'s components include the Information Extractor or "fuzzy C++ parser," which runs as a server process and partially parses entire source files on request. The extracted information is sent to the client and placed in an information repository or "symbol table" for access by developers.

Sniff+ includes a range of other tools: browsers for perusing classes, symbols and hierarchies; a retriever to cross-reference information on the fly; and an editor.

Company officials said support for Taligent will be available later this year.

Chicago and Microsoft Corp.'s Windows NT support will be available in 1995. Sniff+ is priced at $2,990 for a single license. It runs on Unix platforms from a range of vendors, including IBM, Hewlett-Packard Co., Digital Equipment Corp. and Sun, and supports major Unix compilers.

New tool versions aim high

Firms think client/server

By Melinda-Carol Ballou

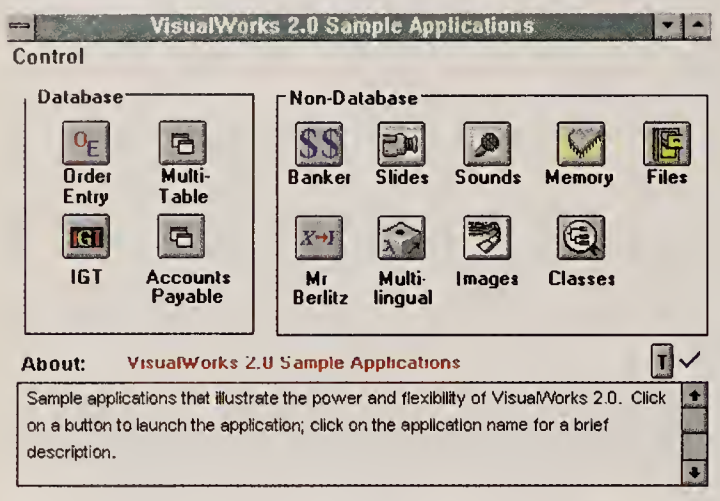
A number of tools vendors recently announced versions that they said target high-end client/server applications development.

These companies include ParcPlace Systems, Inc. and Trinzic Corp.

Key to ParcPlace's VisualWorks 2.0 is a Database Application Creator, which makes the tool much easier to use by letting developers create database applications using a point-and-click format, officials said. The Database Application Creator is made up of three components:

- ObjectLens to view and manipulate relational data as objects.
- A Visual Data Modeler to create maps between tables and objects for ObjectLens.
- DataForms, database-aware objects that can be reused as stand-alone, embedded or linked windows within an application. DataForms are created using customizable templates and generated using a point-and-click format.

VisualWorks offers binary compatibility across platforms without requiring recompilation, officials said. This release offers tighter integration with Windows and OS/2 and support for Windows NT. It also runs on Macintosh and Unix-based systems.



Version 2.0 of ParcPlace's VisualWorks *offers better integration with Windows and OS/2*

Going Pro

For its part, Trinzic introduced ObjectPro, an object-oriented tool for Windows that uses the company's own ObjectPro Object Language with built-in constructs for iteration, assignment, evaluation and basic operations.

During initial application development, ObjectPro allows programmers to build prototypes to verify that they meet the changing demands of users. When the application is ready for delivery, ObjectPro translates the application into C code, compiles it and then links it, producing Dynamic Link Libraries that form an optimized application that can be distributed to clients, officials said.

VisualWorks 2.0 will ship in the third quarter, priced at $4,995 for Unix operating systems and $2,995 for other supported operating systems, including Windows, Windows NT, OS/2 and the Macintosh platform. Database drivers for Oracle Corp. and Sybase RDBMSs are priced at $495 each. ObjectPro will ship this month at a price of $2,995 per seat.

Intersolv widens scope of operating system support

By Melinda-Carol Ballou

Intersolv, Inc.'s Q+E Database Library and Open Database Connectivity (ODBC) pack will now support a range of operating systems including Windows NT, Unix and OS/2, company officials said.

This pack, announced last month, extends the reach of drivers for Microsoft Corp.'s ODBC, which had been available only for Windows. Users of Intersolv's Database Library will now be able to move applications to additional operating systems without retooling, company officials said.

Open options

Some developers agreed that the support for more operating systems is advantageous.

"Although we don't need the additional platform support now, as we look to the future this gives us flexibility," said Carol Thomson, analyst programmer at Duke University Medical Center in Durham, N.C. "An organization as large as the medical center takes in so much data from multiple sources, we are likely to require it." The center uses Q+E drivers as front-end applications to databases throughout the organization.

The Intersolv Q+E ODBC Pack is a plug-and-play set of more than 30 drivers that lets users access data from any application that supports ODBC across all major relational and PC databases.

The Intersolv Q+E Database Library offers developers a single application programming interface (API) that eliminates the complex details of accessing and manipulating data from multiple data sources.

Low-end niche

"This gives portability to developers across a greater number of clients. It's a low-priced solution, and the business model matches up well to what Intersolv is trying to do with PVCS," said Ed Acly, an analyst at International Data Corp., a Framingham, Mass., consulting firm. "This fits into the low-end client/server marketplace."

The products are shipping now. The Intersolv Q+E ODBC Pack costs $499 per user for an operating system-specific version that targets all databases. ODBC drivers for the individual databases are priced at $99 per user.

The Intersolv Q+E Database Library costs $699 per user for each operating system and includes a single license for the Intersolv ODBC Pack.

Standards

CONTINUED FROM PAGE 107

you can't ignore the giant presence of Oracle and the others."

True enough, some object database vendors say. Although analysts estimate that SQL3 will not be road-ready until 1996, some object companies have already planned to implement it when it does appear. Objectivity, for example, will adhere to both ODMG 93 and SQL3, said Doug Polak, vice president of marketing.

Servio, on the other hand, favors ODMG 93 but prefers to wait and see regarding SQL3. "Realistically, we don't have the resources to support both," said Kurt Vittner, product manager. Vittner represents Servio at ODMG meetings.

Overall, object database standards are expected to change the competitive landscape. The products now compete on features; one may support Smalltalk while another favors C++. But speed, scalability and price will differentiate object databases as standards take hold, Browning noted.

"Then the real database wars will begin," he said.

Count me out

Object database users lack a generally accepted way to rate the performance of competing products. The University of Wisconsin has possibly the best shot at getting a benchmark established in the form of its OO7 measure, but that effort has so far incited controversy.

Three of the six major object database firms paid $5,000 to $10,000 each to officially participate in the 105 tests that compose OO7: Versant Object Technology Corp., Ontos, Inc. and Objectivity, Inc.

But a key holdout is Object Design, Inc. (ODI), which leads the object database market (see chart page 107).

"We're unhappy with the process," said Bill Blunden, vice president of marketing at ODI.

The company was so unhappy after last year's testing that it threatened to sue OO7 creators if ODI's scores were published. The scope of the original OO7 benchmark was too small, Blunden said. The test initially called for a single user working on a given object database; ODI wanted to see a multiuser version of the tests.

However, OO7 benchmark creator David DeWitt maintains that the poor performance of ODI's ObjectStore database inspired the vendor's legal threats.

"If it can't win, [ODI] doesn't want to play the game," said DeWitt, who is also a University of Wisconsin computer science professor.

ODI's numbers were never made public and a lawsuit never materialized.

The university is revising OO7 to rate object databases under fire by six to 12 users. The test should be ready by summer's end, DeWitt said.

ODI, however, will not participate, Blunden said. — *Kim S. Nash*

Corporate analyzer designed to sharpen firms' competitive edge

By Stuart J. Johnston

An Oregon company is shipping a Windows tool to help corporations analyze workflow and reduce costs and time to market of their products.

The package, called Process Analysis, provides graphical representations of a company's processes and product flow, according to its developer, Process Research Group, Inc. in Gresham, Ore.

Companies can use the tool to improve their competitiveness. For example, it can help them reduce product development cycle time to get products to market more quickly, Process Research Group said.

Process Analysis, which costs $595, does this by enabling companies to visually modify workflow to identify wasteful activities and process bottlenecks.

Once workflows have been modeled and financial data have been input, Process Analysis generates reports, charts and other graphical output to show how changes reflect cost improvements, or the lack of them, as well as time differences for various processes.

Therefore, the tool can be used to determine profitability of a product and return on assets in addition to helping streamline operations.

Reports, graphs and diagrams created by Process Analysis can be printed to any printer, and data generated can be exported to Microsoft Corp.'s Access 1.1 database, according to the company.

The package requires a Windows-based PC with 4M bytes of RAM and 2M bytes of free hard disk space.

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New Products

Reasoning Systems has announced that Software Refinery, a rapid development environment for building software analysis and conversion tools, is available on Hewlett-Packard Co.'s 9000/7xx Unix workstations.

According to the Irvine, Calif., company, the product reduces the cost and risk of maintaining legacy systems by allowing users to develop tools that automate key maintenance tasks.

Software Refinery can be applied to any programming language and maintenance task and features a parser generator, an object base, unit-level incremental compilation, dynamic linking and an integrated graphical user interface.

Software Refinery costs $19,600.

▶ *Reasoning Systems*
(415) 494-6201

CompuFlex International has announced CompuFlex Object Manager for SQL server, which provides a repository that keeps a complete revision history of all database objects.

According to the Woodland Hills, Calif., company, the product eliminates the need for manual code updates in test and production environments.

Object definitions are automatically verified for syntax and dependencies and stored in the repository when modified by a developer.

CompuFlex Object Manager works with any data modeling tool that generates SQL server Data Definition Language. All functions are performed through a Windows interface.

CompuFlex Object Manager costs $4,000 per server and $1,000 per client.

▶ *CompuFlex International*
(818) 226-5484

High Technology Software Corp. has announced ManageWare 3.0 for creating Novell, Inc. NetWare Loadable Modules and NetWare utilities under Windows.

According to the Scottsdale, Ariz., company, the product is a fourth-generation language that reduces complex network management tasks to simple commands.

ManageWare 3.0 includes a compiler, an interpreter and source code for a variety of sample utilities.

ManagerWare Compiler software development kit costs $895, and ManageWare Interpreter costs $295.

▶ *High Technology Software*
(602) 970-1025

About Software Corp. has introduced 5PM Pro C/S, a software development environment for creating custom user interfaces.

According to the Cupertino, Calif., company, with 5PM Pro C/S, developers can create Macintosh and Windows graphical user interface (GUI) front ends for industry standard SQL relational database management systems without modifying an application.

Features include support for industry standards, project management functionality and high-level GUI design.

5PM Pro C/S starts at $6,999.

▶ *About Software*
(408) 725-4242

Solomon Software has introduced the Visual Basic Rapid Development Tool Kit, a developer's tool that enables customized Microsoft Corp. Visual Basic applications to be seamlessly integrated with the company's Solomon IV for Windows accounting software.

According to the Findlay, Ohio, firm, the tool kit gives developers access to the design and development dictionaries used to develop Solomon IV.

Users can customize any object property without modifying source code.

The Visual Basic Rapid Development Tool Kit costs $2,995.

▶ *Solomon Software*
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COLLEGE INFORMATION SYSTEMS DIRECTORS ARE AMONG THE FIRST TO SET UP INFORMATION SUPERHIGHWAYS. THEY ARE NOW EXPERIENCING THE MANAGEMENT ISSUES OTHER IS EXECUTIVES WILL FACE TOMORROW.

Student Drivers

BY ERIN CALLAWAY

Bob Prochnow/SABA

Marist College's Michael Corbett: *IS chiefs must be proactive to succeed*

MICHAEL CORBETT DIDN'T expect to find himself choking on dust balls when he drove Marist College onto the information superhighway. But ever since he began managing Marist's network linking small New York manufacturers, he's spent a lot of time with his head down, knees bent and backside up.

"I spend more time than I care to relate crawling around floors in the dust connecting modems," Corbett says.

There's been no shortage of Flash Gordonesque hype about what the information superhighway will do some day for John Q. Public. But what managerial concerns will be filling the in-baskets of the information systems managers who will collectively serve as the information superhighway's turnpike authority? There's no need to wait to find out: Those issues are already surfacing.

Information executives at U.S. universities are finding out now what it means to manage an electronic highway. This isn't blue sky, theoretical academic stuff. People like Corbett are building networks that offer many of the interactive capabilities that the Time Warners of the world just talk about.

Managers such as Corbett, Indiana University's Donna Burrow and Virginia Polytechnic Institute's Andy Cohill are running up against new versions of old managerial issues such as fee structures, connectivity, educating users and playing hardball with vendors. And they include unanticipated problems such as obscure copyright laws and violations of "netiquette."

ExceLink

Why is Corbett spending so much time on the floor? ExceLink, Marist's network for small manufacturers, serves more than 350 companies in the mid-Hudson Valley, Long Island and New York state southern tier. And with 500 more companies joining the Poughkeepsie, N.Y., school's network by the end of this month, you begin to wonder how Corbett can keep up with them all.

Corbett says users sign up for ExceLink because the network provides practical services and business opportunities they cannot find on their own. Those services include electronic mail, a marketplace database of bids and suppliers, an Internet gateway to more than 850 commercial databases and on-line forums where they can discuss their common business issues.

But getting users connected to ExceLink is hardly the end of the work. Corbett also has to organize and distribute information to users who expect ExceLink to not only improve but also expand their businesses. That's no small order.

Because most of the network's current users were not previously connected to any on-line service, Corbett is still surprised to find how hungry they are for the com-

Student drivers, *page 114*

Student drivers

CONTINUED FROM PAGE 113

petitive edge ExceLink's serviees give them. He says it took some time to accept users' expectations but that doing so has added to ExceLink's suceess.

"Purely and simply, users want to know how this system is going to help them make money," Corbett says. "For a while, that was hard to get used to. We had to get very savvy at targeting the exact benefits of every serviee ExceLink provides."

To Corbett, getting savvy means getting proactive, a role he says an information highway manager must learn to fill if he wants to be successful. As he sees it, you ean't just put users on the highway without teaehing them how to drive.

"You ean put up aceess to thousands of databases, but if you leave the users to figure out what to do with the information they find, they won't want to stay on your system," Corbett says.

One way Corbett keeps users on ExceLink is to provide them with information before they come looking for it. ExceLink's bid service, for example, automatieally compares a company's supplier records to international and national opportunity databases and sends them daily via E-mail with new matehes. That's the kind of serviee that keeps users happy.

And happy users go right to Corbett's bottom line. Even though ExeeLink is a not-for-profit venture, Corbett still needs money to keep the system running. In his opinion, that leaves him with the same eoncern as any for-profit business: how to keep customers paying.

AT A GLANCE

Electronic Village
VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
BLACKSBURG, VA.

On-line: January 1994

Users: 35,000 Blacksburg residents

What: Connects schools, government offices, businesses and residents to a $6 million digital electronic center with more than 42 miles of high-speed, high-capacity fiber-optic cable. Used for local shopping and advertising, on-line training, classroom education and communication with medical professionals.

ExceLink customers do pay for the services they reeeive, and Corbett has struggled with developing a fee strueture that won't annoy them. Currently, he's working on a plan that would allow eommitted users to pay a flat-base rate. But many of ExeeLink's users still pay up front into an eserow aeeount opened when they first joined the network. The user's fee is drawn against the account on a monthly basis.

"I hate to force them into frequent purchase deeisions, but that grant is not going to last forever," Corbett says, sighing.

Library of the Future

Balaneing cost with serviee is a concern Donna Burrow, systems offieer at Indiana University and Purdue University of Illinois (IUPUI), definitely shares. IUPUI's Library of the Future is also a not-for-profit effort and serves not only 28,000 students but the whole state of Indiana as well. The library is wired with 1,700 data eonnections and provides workstation and remote access to data, voice, satellite, videodisk and beta and VHS that allows you to watch a videotape via the network on your computer terminal.

With so many users comes a high demand for all kinds of network applications, making software licensing costs a huge factor in what the library can actually put on-line. A lack of available applications for remote networks further complicates the issue for Burrow. She frequently has to decide whether to buy expensive software that doesn't make complete use of the network's remote capabilities.

Copyright laws are another obstacle Burrow has come across. "The copyright issue is one that everyone on the information highway is definitely going to have to deal with," Burrow stresses.

The heart of the issue concerns media conversion and distribution. Current eopyright laws raise questions and leave gray areas about converting materials from one media to another or distributing material over a computer network.

In the Library of the Future, those gray areas have prevented Burrow from electronically pro-

Student drivers, *page 118*

Driving forces

IS executives agree that the information superhighway can significantly benefit business and education, especially in the areas of information exchange and global competitiveness

Business and education benefits	Agreement score*
Widespread use of the information highway is essential to achieving its benefits	6.05
The benefits of the information highway for business are significant	5.99
The benefits of the new highways for education are significant	5.97
Information highways are essential for U.S. competitiveness in the global economy	5.76
Benefits of information highway	
Electronic interchange	
Electronic data interchange (EDI) 5.97	
Electronic databases 5.88	
Electronic mail 5.80	
Electronic imaging and document exchange 5.71	
Electronic interchange scale	5.84
Business coordination	
Better responsiveness to customers 5.78	
Better coordination with suppliers 5.67	
Better coordination among business units, divisions and sites of the firm 5.29	
Better coordination with regulators 4.73	
Business coordination scale	5.37
Business strategy	
New strategic applications/ uses in business 5.63	
New information for decision-making 5.42	
Access/Exploitation of niche markets 5.10	
Reduction of business costs 4.94	
Business strategy scale	5.27
Business opportunities	
Increase market opportunities 5.54	
Up the ante for competing by placing all firms on new higher-level ground 5.12	
Increase business profits 4.95	
Increase business sales 4.85	
Business opportunities scale	5.12
Consumer benefits	
Provides consumer information 5.35	
Understands consumer needs and demand 4.85	
Expands consumer product variety 4.84	
Provides consumer protection 4.01	
Consumer benefits scale	4.76

* Scores range from 1 to 7, where 1 is disagree and 7 is agree

Source: Society for Information Management International 1993 membership survey on the perceived benefits of the information highway

I NEVER THOUGHT I'D BE DOING THIS

Perhaps the toughest adjustment for an IS manager to make is to deal with the information highway's vast and untamed cyber culture, where there's no one to enforce social rules.

Though most users seem to follow what has come to be known as "netiquette," organizations take a risk when they let their members and employees loose on-line. And as Polly Ann McClure, vice president and chief information officer at the University of Virginia, explains, someone has to take charge when a user steps out of line.

Polly Ann McClure: *Cultural adjustment is the toughest*

"My primary focus is definitely on the organization I work for," McClure says. "But when you become a part of the information highway, all of a sudden there is a new environmental context that has to be a part of how you manage that enterprise. If one of our students misbehaves on-line, we can have an inter-institutional problem on our hands. And since the E-mail they use has the university's name on it, and I'm the one who manages the system, I'm the one who also gets the call."

Unfortunately, McClure speaks from first-hand experience. She recently received a complaint about a message that was publicly posted on the Internet by a University of Virginia graduate student. Apparently, the recipient of that message interpreted the person's comments as a threat. The next thing McClure knew, she was dealing with a discipline problem.

"Ten years ago, a systems manager would never have to address anything like this, let alone a vice president or CIO," McClure says. "But these days, it's not that uncommon."

—Erin Callaway

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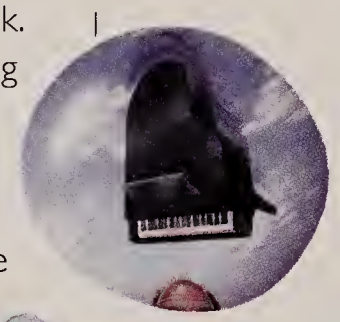

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Regardless of what client-server tools you employ, there are certain realities you must face.

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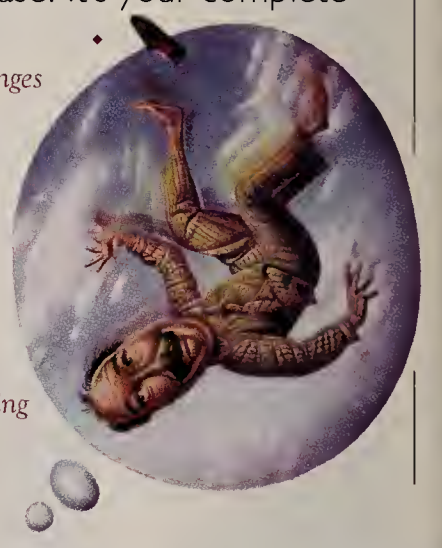
The SCALE repository is more than just a database. It's your complete logical data model containing the Entity Relationship diagrams, business rules and data road map of your entire enterprise.



The IRS changes a rule and you find yourself searching through your code to find the place where the rules are enforced. And you get that feeling that you're falling.....

With Enterprise Developer, you define your data model once in the SCALE business model repository. Or, you can quickly reverse-engineer from your existing database catalogs.

Either way, the SCALE transaction processor leverages the information captured in the business model repository to cascade rules to the server and your client applications automatically. SCALE also automates transaction processing, including all master detail processing and it implements optimized retrieval and commit strategies.

So you can focus on building the absolute best feature-set for your users. While achieving true RAD (Rapid Application Development).

Then, Enterprise Developer lets you synchronize your applications with the rules in the repository courtesy of our optional Auto-Maintenance feature. So when

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EASY. CREATING IT IS NOT SO EASY. THAT'S A NIGHTMARE.

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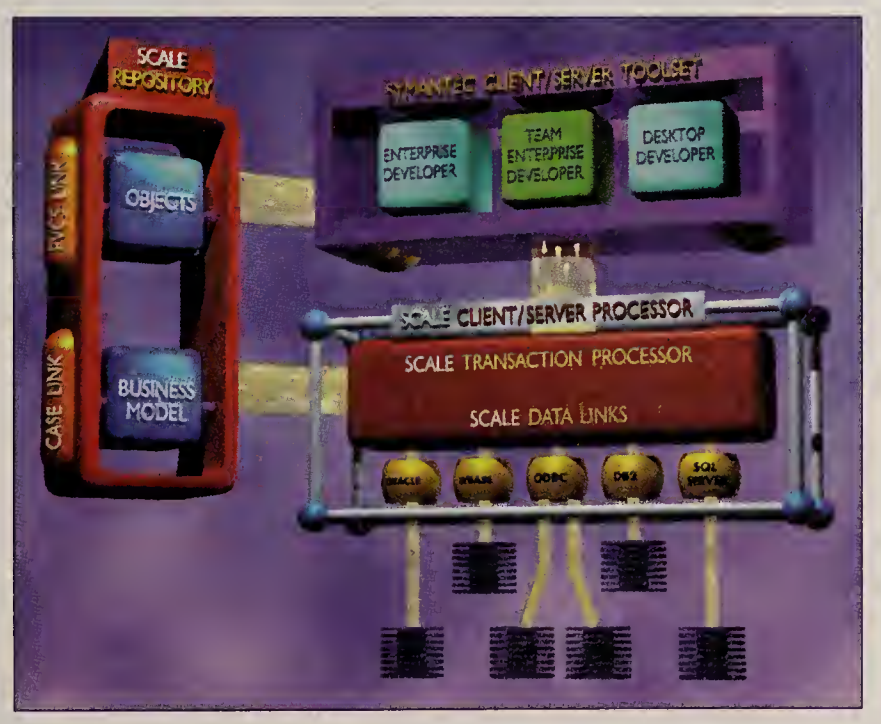

SCALE provides three revolutionary architecture features to speed application development: 1.) Robust business model repository to centralize data models, data locations and business rules; 2.) Optimized transaction processor to automate processing of all your client-server transactions; and 3.) SCALE data links to provide optimized access to major database engines.

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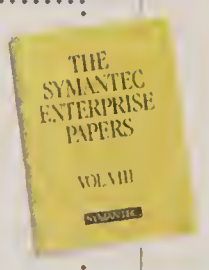

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Student drivers

CONTINUED FROM PAGE 114

viding users with certain materials. But until copyright laws are updated to fit the information highway age, many films will be off-limits even within the library because of restrictions on the number of viewers using the material at one time.

For example, an IUPUI professor recently wanted to load a film onto the network so students could view it in the library. To do that, the film would first have had to be converted to video because it was so old.

"Changing the format would have been a violation of copyright law," Burrow explains. "And the copyright owner can demand royalties if the film is shown simultaneously in different locations. If I have five people on the network all viewing the movie at the same time but on different workstations, are they violating copyright or not?"

For now, Burrow is focusing her energy on what the system can do and helping users adapt to the on-line environment. That includes plans for focus groups to identify troubles users have. Burrows hopes the on-line help desk will take the training from there.

"This system was designed so a user can become productive without having to know anything about how the computer works. But I'm keeping an eye out for frustrated people. Everyone runs into their problems," she says.

AT A GLANCE

ExceLink
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On-line: April 1993

Users: 800+ small manufacturers statewide

What: An electronic marketplace. Using their own PCs and modems, member companies connect to the mainframe at Marist to partake in electronic discussions, send E-mail, post company descriptions and search for national and international job opportunities.

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Electronic Village

Andy Cohill, director of the Electronic Village in Blacksburg, Va., also knows it's not easy to teach ordinary people how to use the Internet.

"We've always known that this was an education project," Cohill says. "But even knowing that, we still haven't figured out the best way to teach them what this is all about. People want well-packaged educational material. They don't want to hear about Unix command line access."

The Electronic Village, a joint project between Bell Atlantic Corp., Virginia Polytechnic Institute and State University and the town of Blacksburg, brought more than 1,000 community users online in January. Cohill is finding that the structure of a community network makes providing a constant, optimal level of customer support difficult. Add the fact that most of the Electronic Village's users aren't experienced with computers, and the problem doubles.

Cohill's latest idea for providing some extra customer support during the off-hours may just allow him and his staff to spend a little more time living those off-hours. They've already started taping a series of 12 half-hour talk show tutorials on what the Electronic Village is all about and what kinds of things people can use it for. The shows will air on local community access television and will feature Cohill, town users and other project staff members.

Cohill says he is doing his best to figure out exactly what users want to hear. He hopes the community TV show will help do that. He's also trying to educate people by planning some nontraditional training, such as hand puppet shows. "We don't know exactly what we're going to do yet, but it's a fun idea," he says.

While he's training the users who are already on board, Cohill is busy working to expand the Electronic Village to the rest of Blacksburg's 35,000 residents. Though Virginia Tech has helped springboard the Electronic Village into existence, Cohill is responsible for overseeing the design, development and implementation of the project. And when it comes to expanding connectivity, his biggest gripe is with router vendors.

"These guys come in to my office and say, 'We have this great router and it's only $2,000.' Two thousand dollars?" Cohill says. "We're approaching a day when everyone will need a router in their home, and [vendors] still want to charge that much for a box the size of a modem with about the same amount of electronics."

BOB PROCHNOW/SABA

"You can put up access to thousands of databases, but if you leave the users to figure out what to do with the information they find, they won't want to stay on your system."
MICHAEL CORBETT, ExceLink manager

"The information highway is about real people connecting for practical reasons. To find things like 'Creamette Brand Macaroni is on sale for a buck' — that's not just the same old junk on the Internet."
ANDY COHILL, Director of the Electronic Village

Expensive hardware hasn't stopped Cohill from putting the Electronic Village to practical use. Three local grocery stores already advertise their weekly specials electronically and this month will provide electronic shopping and grocery delivery. Residents will be able to select items by using a "gopher" search menu to determine which retailer has the product they want, then E-mail their shopping list to the store, where their order will be filled for pick-up or delivery.

"The information highway is about real people connecting for practical reasons," Cohill says. "To find things like 'Creamette Brand Macaroni is on sale for a buck' — that's not just the same old junk on the Internet."

Cohill says the grocery stores are thrilled about being able to advertise electronically. And shoppers, of course, are equally excited because the network can save them the time and effort of actually shopping themselves. Cohill is pleased because he thinks the success of the grocery store project will encourage other businesses and more users to join the Electronic Village.

Unfortunately, getting other businesses to take advantage of the Electronic Village's offerings has not been easy. In fact, as much as he'd like to put more effort into soliciting their participation, Cohill just doesn't have the time. He's too busy providing support and training to users and working with vendors to take on marketing, too.

Given the amount of effort he's been able to put into selling the Electronic Village to the people of Blacksburg, Cohill says he's happy with the small successes he's had. Nonetheless, he's finding that being a systems director, information provider, marketing director, recruiter and cheerleader is tiring.

And Cohill says he's lacking that killer success story that would persuade more businesses to invest in the Electronic Village. He's also lacking a development staff that could design business interfaces and a marketing staff to sell on-line advertising. But he's convinced there's tremendous potential for any business that comes on-line.

"The thing I'm dying to get on is a pizza business," he says. "This town runs on pizza. And it's a perfect business model. It's demand-driven, you don't want to lose customers, you typically have to deal with peak hours and the phone is inherently inefficient. If I could just get one of the parlors to invest $20,000 in a gopher, I know their volume would quadruple." ■

Callaway is *Computerworld*'s assistant researcher.

AT A GLANCE

Library of the Future
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On-line: April 1994

Users: 28,000 students and Indiana residents

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IUPUI

WHO AM I?

Often working with a small staff, information highway systems managers frequently end up wearing mutiple hats to get business done. Here's a few of the roles they play:

- Marketing director
- Business recruiter
- Advertising executive
- Internet cheerleader
- 'Netiquette' disciplinarian
- Systems director
- Help-desk operator
- Project leader
- Trainer
- Information provider

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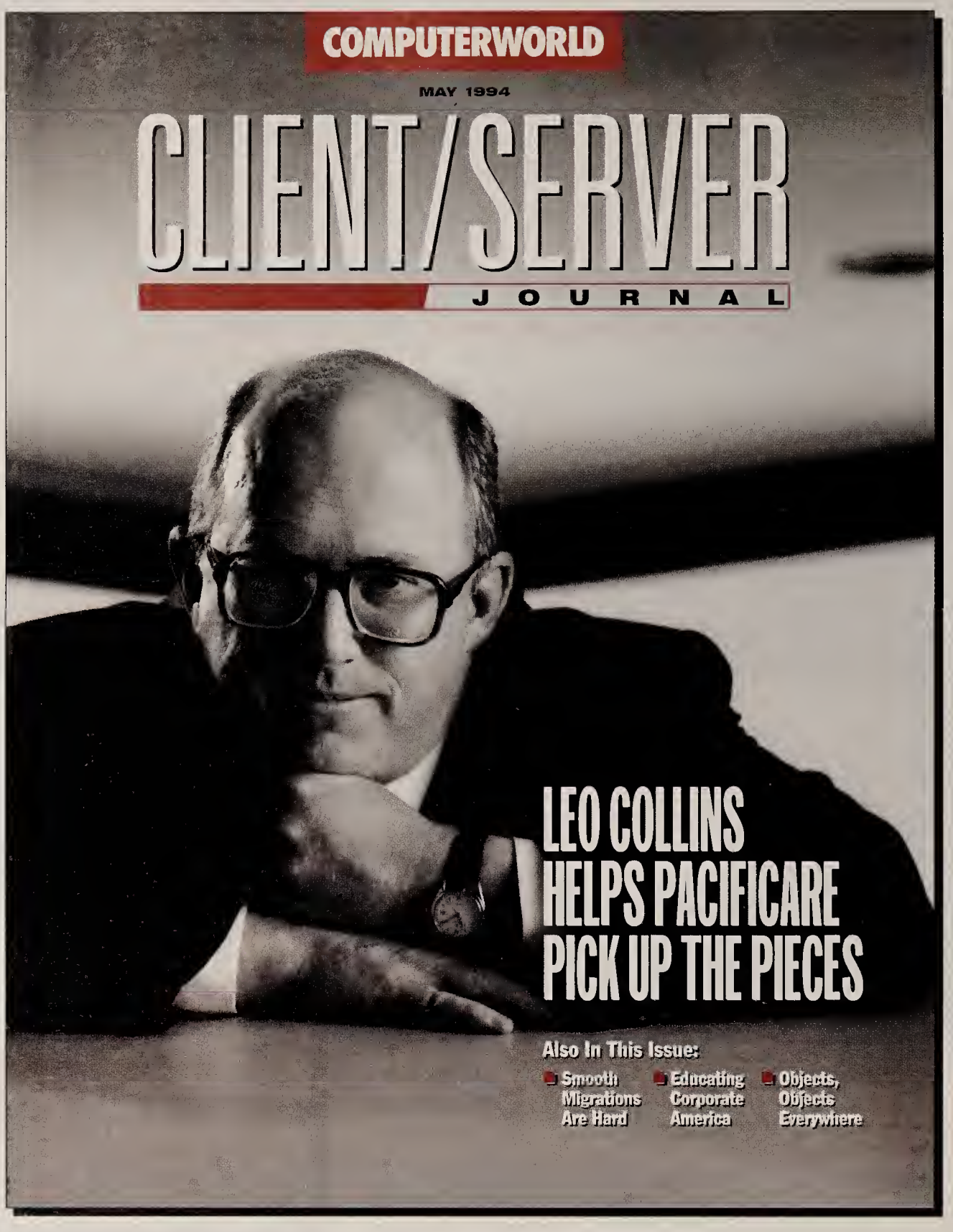

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COMPUTERWORLD

Commentary

Robert A. Zawacki

Do IS and teams mix?

Do self-directed teams (SDT) work in IS organizations? After seven years observing SDTs in IS, I am slowly coming to the conclusion that SDTs are *not* for IS organizations.

About one-third are failures, judging from the companies I have researched, consulted or helped audit. This is not a very good track record for IS organizations. (This failure rate is identical to the failure rate for total quality management programs.)

Many IS organizations talk about SDTs, and their successes are even quoted in the computer press. Yet when I visit these organizations and audit their teams, most have SDTs in name only and indeed have nothing but glorified staff meetings.

Just more meetings

I recently gave a presentation at a major computer manufacturing company on the history of SDTs and how to implement them successfully. At the first coffee break, the senior vice president for human resources called me aside and said, "We don't have SDTs, we have teams attending meetings." Yet this firm was often quoted in the computer press as a leader in team formation and effectiveness. When I talked to the systems people in this organization they said, "Here we go again" or, "This is the flavor of the month."

Many IS leaders believe their staff is empowered to make decisions with the customer, and SDTs are a natural extension of that empowerment. But when I interview team members, they do not believe they are empowered and in fact will tell me there is a lack of trust between them and management.

Thus, to use the current catchphrase, "Leaders can talk the talk, but they can't walk the walk." The behavior of IS leaders gives them away. They simply don't want to give up *control*. I don't blame managers for resisting the movement to SDTs. They have the most to lose — their jobs.

Only about 50% of today's top-down IS managers can become successful coaches. But the ability of the manager to become a coach over time may be the most important variable to ensure the success of SDTs.

Support of the top leadership and human resources is critical because the performance appraisal and reward systems must change to support a team effort. Leadership must change the way the job performance of IS staff is evaluated. Unless the performance appraisal and reward system is changed to include meaningful peer input, SDTs will never get to the stage where they increase productivity.

Long-term benefits

IS leaders must recognize that creating SDTs can be a journey that requires training so intense it will even cause a temporary drop in productivity.

SDTs often die, however, because IS leadership does not stay the course. They expect immediate positive results, and when they don't see the results, they usually stop emphasizing SDTs. The SDTs then slowly die due to a lack of reinforcement for the change program.

Teams must do the training up front or pay the price later. While SDTs have tremendous potential for increasing motivation and productivity, they are not a good fit with the IS culture and the personality of IS leaders.

IS leaders are looking for a quicker return on their investment, are not as comfortable talking about reinforcing this "fuzzy" system and tend to start SDTs and then let them die a slow death by ignoring them. Without true commitment, SDTs are just the flavor of the month.

Zawacki is a professor of management and international business and KPMG Peat Marwick distinguished scholar in residence at the University of Colorado at Colorado Springs.

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Calendar

Management seminars to air via satellite

The National Technological University in Fort Collins, Colo., will host a series of five improvement seminars covering aspects of management and planning tools and techniques via interactive satellite.

The seminars will feature leading management and planning executives and consultants and will air once a month from July through September. Topics and presenters include the following:

- July 11: "Using the Seven Management and Planning Tools to their Maximum Advantage," presented by Michael Brassard, director of new product development at GOAL/QPC.
- Aug. 8: "Building a National Learning Environment with Continuous Improvement to Remain Competitive in a Rapidly Changing Global Marketplace," presented by Patrick K. Reilly, chairman emeritus for the Council for Continuous Improvement.
- Sept. 12: "A Dual-Role Application for 'Benchmarking' — as a Management Practice and a Quality Practice," presented by Gregory Watson, vice president, Xerox Quality Solutions.
- Oct. 12: "Gaining World-Class Quality with Statistical Engineering," presented by Dorian Shainin, founder of Shainin Consultants.
- Nov. 14: "Linking Your Total Quality Management Process to Your Business Objectives," presented by George Labovitz, chairman and chief executive officer of Organizational Dynamics.

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JUNE 26 - JULY 2

CAUSE Management Institute. Boulder, Colo., June 26-30 — Professional development program for managers of information technology in higher education. Contact: CAUSE, Boulder, Colo. (303) 449-4430.

Building the Next Generation Applications: Putting Business First (APL1). San Antonio, June 27-29 — Contact: Ashley Pearce, Gartner Group, Inc., Stamford, Conn. (203) 967-6757.

Database & Client/Server World. Boston, June 28-30 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

PC Expo. New York, June 28-30 — Contact: Bruno Blenheim, Inc., Fort Lee, N.J. (201) 346-1400.

Project Leadership Conference. Chicago, June 28-30 — Theme: Making good project managers into great leaders. Contact: Sophia Zouras, Applied Business Technology, New York, N.Y. (212) 219-8945.

RM25: The Relational DBMS Silver Anniversary Conference. Boston, June 28-30 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

JULY 3-9

Enhancements to Mature Chargeback & IS Financial Reporting Systems. Scottsdale, Ariz., July 6-8 — The seminar will focus on information systems chargeback and financial effectiveness and efficiency. Contact: Financial Management for Data Processing, San Francisco, Calif. (415) 731-3706.

Technomics '94. Orlando, Fla., July 6-8 — Topics: Sources of lease financing; impact of specialization, diversification and captives; strategies and tactics as the industry matures; impact of leasing on corporate financial ratios. Contact: International Computer Negotiations, Inc., Winter Park, Fla. (407) 740-0700.

JULY 10-16

1994 APPC/APPN Technical Conference. Boston, July 12-15 — Keynote speaker: Ellen Hancock, IBM's senior vice president of networking solutions. Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

Third Annual Summer Meeting, Forming Partnerships with Industry. Washington, July 13-14 — Contact: Tracee Joltes, The National Technology Transfer Center, Wheeling, W. Va. (304) 243-2535.

Fourth Annual National Technical Information Service/Japan Information Center of Science and Technology Conference. Boston, July 14-15 — Theme: Japanese scientific and technical information. Contact: NTIS, Springfield, Va. (703) 487-4819.

JULY 17-23

Internal Consulting in Large Organizations: The Skill of Technical Liaison. Washington, July 18-20 — Contact: Continuing Engineering Education Program, George Washington University, Washington, D.C. (202) 994-6106.

Communications Opportunities in Health Care. Washington, July 19-20 — Topics: Generating new business through health care reform, networking requirements of managed care, telemedicine, home-centered care and other health care delivery trends, automated claims processing, computerized patient records and teleradiology. Contact: TeleStrategies, Inc., McLean, Va. (703) 734-7050.

Configuration, Performance and Storage Management for Enterprise Client/server Systems. Washington, July 20-21 — Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

Conference for Artificial Intelligence Applications on Wall Street and Worldwide. New York, July 20-21 — Focus: "Developing and Profiting from Advanced Technologies Trading and Asset Management." Contact: IBC USA Conferences, Inc., Southboro, Mass. (508) 481-6400.

JULY 24-30

Systems Software Conference '94. Orlando, Fla., July 24-29 — Contact: Computer Associates International, Inc., Islandia, N.Y. (800) 925-2663.

Sixth Annual Computer Security Incident Handling Workshop. Boston, July 26-27 — The workshop is targeted at the growing number of computer security professionals who must deal with increasingly sophisticated security incidents and system vulnerabilities. Contact: Lawrence Livermore National Laboratory, Livermore, Calif. (510) 423-2455.

New Directions in Cellular '94. Washington, July 26-27 — The conference will focus on the competitive outlook for cellular-based personal communications services (PCS); implementation challenges for time division multiple access, code division multiple access and global systems for mobile communications; wideband digital radio technology and economics; PCS spectrum allocation and the auction process; and Cellular Digital Packet Data user demand analysis, new antenna technology and fraud control. Contact: TeleStrategies, Inc., McLean, Va. (703) 734-7050.

Essential Skills and Knowledge for Effective Incoming Call Center Management. Seattle, July 26-28 — Contact: ICMI, Inc., Annapolis, Md. (410) 267-0700.

Windows World '94. Chicago, July 26-28 — Focus: Implications and impact of enterprise computing and the benefits of implementing a business-oriented information technology strategy. Contact: The Interface Group, Needham, Mass. (617) 449-6600.

Managing Enterprise Networks '94 — A Survivor Guide to Network and Systems Management. Boston, July 27-29 — Keynote speaker: Conference Chairman David Passmore, president of Decisis, Inc. Topics: "Strategic Decisions: Choosing a Management Platform"; "People and Money: Management Issues in Network Computing." Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

JULY 31 - AUG. 6

Tools USA '94. Santa Barbara, Calif., Aug. 1-5 — Contact: Tools USA '94, Santa Barbara, Calif. (805) 685-1006.

International Storage Systems Symposium. San Francisco, Aug. 2-5 — The four-day conference, devoted exclusively to storage, will provide 60 in-depth technical classes. Contact: Skill Dynamics, Dallas, Texas (214) 406-7200.

IS Self-Assessment and One-on-One Benchmarking seminar and IS Financial Benchmarking and Peer Analysis conference. Washington, Aug. 2 (seminar) and Aug. 3-5 (conference) — Seminar is intended for those contemplating information systems benchmarking or interested in starting the benchmarking process with little out-of-pocket-expense. Conference presents the variety of principles and practices used to conduct internal and external IS financial benchmarking and peer analysis. Contact: Terence Quinlan, Financial Management for Data Processing, San Francisco, Calif. (415) 731-3706.

Macworld Expo. Boston, Aug. 2-5 — Contact: Macworld Expo International hot line, Hyde Park, Mass. (617) 361-3941.

AUG. 7-13

Share Summer 1994 Meeting. Boston, Aug. 7-12 — Keynote speaker: Louis V. Gerstner, IBM chairman and chief executive officer. Contact: Share, Chicago, Ill. (312) 822-0932.

The Asynchronous Transfer Mode (ATM): Foundation for Broadband Networks. Denver, Aug. 8-9. Also showing in Troy, Mich., on Oct. 10-11; Philadelphia on Oct. 24-25; and in Atlanta on Oct. 26-27 — Contact: Lori Ann Milhaven, International Institute for Learning, Inc., New York, N.Y. (212) 758-0177.

Re-engineering with Knowledge: Getting the Most Value from Your Most Valuable Asset. Chicago, Aug. 13 — One-day seminar highlights the effective dissemination, consolidation and automation of knowledge. Contact: Carnegie Group, Pittsburgh, Pa. (800) 284-3424.

AUG. 14-20

The On-line Networking Exposition and Bulletin Board Service Convention. Atlanta, Aug. 17-21 — Contact: One, Inc., Aurora, Colo. (303) 693-5253.

SEPT. 11-17

1994 International Client Forum. Orlando, Fla., Sept. 11-14 — Contact: Susan Spatafora, International Client Forum manager, System Software Associates, Inc., Chicago, Ill. (312) 641-2900.

Distribution/Computer Expo '94 East. Atlantic City, Sept. 13-14 — Contact: "C.S. Report," Uwchland, Pa. (610) 458-6410.

SEPT. 18-24

PictureTel User Group's Third Annual Conference. Scottsdale, Ariz., Sept. 18-21 — The conference will offer an exchange of information on strategies, directions, requirements and concerns relating to videoconferencing and multimedia at the desktop. Contact: Catherine Takacs, PictureTel User Group, Morristown, N.J. (201) 425-1414.

Networks Expo '94. Dallas, Sept. 20-22 — Contact: Bruno Blenheim, Inc., Fort Lee, N.J. (201) 346-1400.

SEPT. 25 - OCT. 1

Graph Expo East. Philadelphia, Sept. 25-28 — Contact: Graphic Arts Education and Research Foundation, Reston, Va. (703) 264-7200.

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Bruce Harreld
Computerworld Reader
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President, Boston Chicken

As problems go, the one facing Boston Chicken was the kind we'd all like to have: they were growing too darn fast. So much so that their field offices were having trouble keeping up-to-date with their support center. After much burning of the midnight oil, they realized they needed a simple, effective software package to both keep track of and plan their meteoric rise. One thing was clear—they were at a definite crossroads.

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by michael cohn

A warped and wacky view of computer history

Ever since his first days as a programmer, Michael Cohn knew he was destined to write high-tech humor. He came from humble beginnings, cramming strange jokes into the in-line documentation of assembler language programs. Not surprisingly, no one noticed.

In the late 1980s, Cohn hooked up with Computerworld as a columnist. Since then, his high-tech humor has confused, amused and entertained computer professionals with such enlightening and burning topics as "Why CIOs are Almost Like Regular People" and "Good Places to Hide the Night You Go Live."

When asked to explain Cohn's longevity with Computerworld, Editor Paul Gillin responded: "He works cheap."

Cohn has worked in high tech for more than 12 years, the last few at a very large computer company and, most recently, at a small computer company. Unfortunately, it's the same company.

What follows is an excerpt from Cohn's first book, Fear of Computers (Northwest Publishing, Inc., [800] 398-2102), available later this month in local bookstores.

Within 10 years, scientists predict, there will be more computers in this country than people. We're being outnumbered; even surrounded! The prospect is frightening. What if all these computers get a little fussy? Or angry? Or want the right to vote?

Warped, *page 128*

ILLUSTRATIONS BY DAVID CLARK

Warped history

CONTINUED FROM PAGE 127

Computers wouldn't seem all that scary if you knew how they got here in the first place. What you might need is a revealing, brief and comparatively inaccurate history of computers, big and small, and the big and small fortunes made because of them.

The first computer

Scientists, archaeologists and historians argue about what actually constituted the first computer. Then again, scientists, archaeologists and historians probably argue about everything, including where to go for lunch.

There are many conflicting theories. . . . Was the human hand the first computer? Or what about toes? When the Chinese invented the first clock in 3,000 B.C., was that a computer? And how could they tell if it was a couple of minutes fast?

The consensus among scientists today appears to be that the abacus was the first computer, in part because the abacus was the first true arithmetic device, the first calculating tool with moving parts and because the first time somebody dropped one, those little beads probably shot in 20 different directions and the abacus became the first computer to crash.

The 1870s

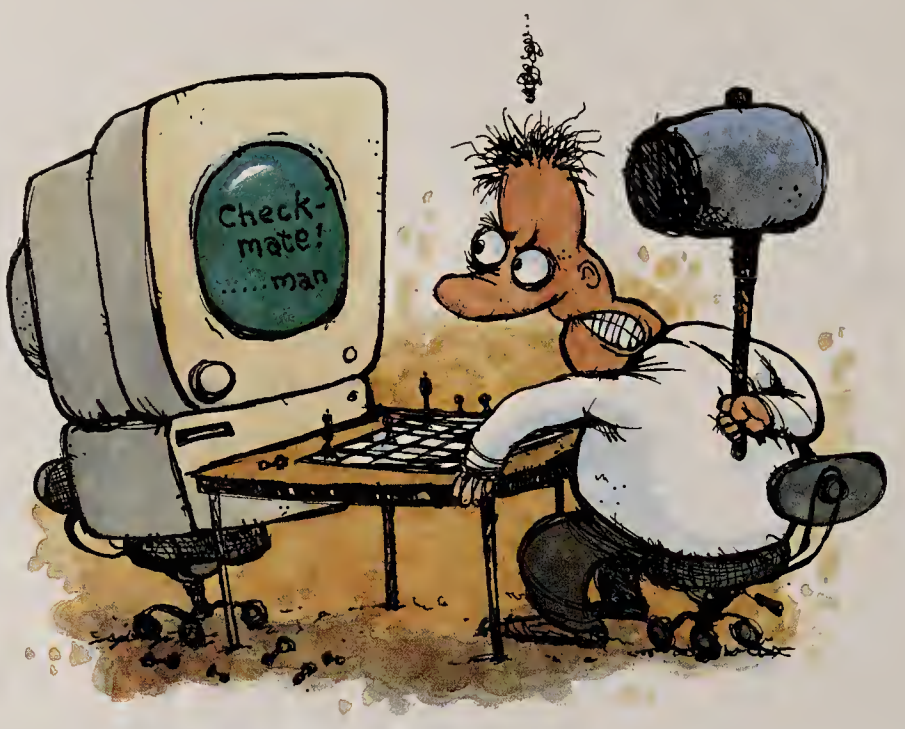
Alexander Graham Bell gets credit for inventing the telephone, but few people know that he actually invented both the computer *and* the telephone. Tragically, history misquoted the greatest moment in communications; what Bell *really* said was: "Mr. Watson, come here, I want you. . . . The system's down again."

The early 1900s

America was growing like gangbusters at the turn of the century. There were people everywhere — crowding into cities, farming, moving West — and still it was impossible to find a fourth for bridge.

In the meantime, the folks at the Census Bureau were doing everything by hand, and theirs were pretty full. They were supposed to count the population every 10 years. But by the time they finished, it was time to start over again. Reminds me of my kid cleaning his room.

So this inventor named Herman Hollerith came up with a pretty good idea: First build a huge, complex, automated tabulating machine. Then rent it to the Census Bureau and, finally, figure out a way to get it downstairs from his third-story apartment.



The idea worked like a charm. The bureau knew how many were in the U.S., and Hollerith was able to sock away a large down payment on a new Ford roadster, in case someone were to invent one.

Unfortunately, Hollerith failed to become a household name, probably because folks were too fixated on all the other industrial revolution inventions of the time, such as Pez candy. (All right, maybe they didn't make Pez a hundred years ago. . . . It only tastes like it.)

The mid-1940s

Nothing speeds up the evolution of technology like a good war. In the 1940s, European engineers raced to build a computer that could unscramble messages and decipher enemy code. But only the Germans were sufficiently advanced to produce electronic computer printouts. In 1945, a machine in Berlin spit out the first printed computer statement: "Get me out of here; I think we're losing."

The 1950s

Computers got smarter. A computer was finally able to beat a human being in chess. But 10 minutes later, the computer proved no match for that same human being and a sledgehammer.

The 1960s

Computers got a little smaller, but the number of computer buyers got much bigger. Businesses clamored to gain advantage by installing computers before their competitors. By 1964, there were over 500 computers in the state of California.

Unfortunately, the only programmers around were three guys from a junior college in Sacramento, who basically held the state's high-tech industry hostage while spending all their earnings on cheap beer.

The early 1970s

The first pocket calculator was invented. But the device took a while to catch on because everyone was losing his or crushing it while doing "the bump."

Few people also realize that in 1973, a sophomore at Iowa State invented the first commercially viable PC on his kitchen counter years ahead of anyone else. However, one fateful Friday night, one of his poker buddies mistook the machine for a microwave oven and doused both the device and the kid's future in 8 ounces of Cheese Whiz.

The 1980s

The decade started with the industry in full stride; PCs were everywhere. High-tech salesmen raked in a bundle. Computer programmers made more than lawyers. Silicon Valley realtors drove German sedans.

Computers became commonplace. There were automated teller machines and grocery store scanners. Computers answered telephones. And kids preferred Nintendo to playing ball with dad, 4-to-1.

But during the late '80s, bad things started happening to computer companies. Maybe the economy went bad. Maybe competition cut into profits. Maybe folks OD'd on Pac-Man.

Whatever the case, high tech took a nosedive.

Businesses downsized from mainframes to PCs. Programmers downsized to Toyota Tercels.

Sure, people were still interested in computers, but computers just couldn't compete with the newer intellectual pastimes such as bungee jumping or watching professional wrestling.

The present

Today, the computer industry is too small. The number of still-in-business computer companies is too small. The average computer programmer's raise is too small.

And worst of all, computers are too small.

What used to fit on your desk now fits in your lap, or your palm or your purse. Some of them don't even need keyboards; they're supposed to recognize handwriting. That will be a feat, because most of the time *I* can't even recognize my handwriting.

Today's computers are just too tiny, just like those pesky pocket calculators. My guess is we'll start misplacing them again or mistake them for the VCR remote. Which means that someday you'll lose thousands of dollars in computer equipment between the cushions of the family room couch. ■

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Your job will still be tough, but you might find time for lunch. To find out more, call 1-800-NEC-INFO. Or, for a fax: 1-800-366-0476. Ask for sheet no. 9773772.

intel inside

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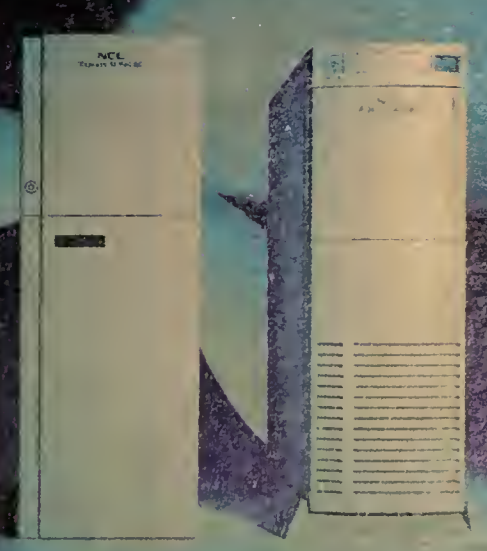

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Planned Editorial Features:

(subject to revision)

- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Information Systems salaries from Computerworld's annual survey with the Association for Systems Management
- And much more!

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Jason K. Whitehair
Recruiting Manager/Systems Engineering
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Computer Careers

BY LESLIE GOFF

E-MAIL EDI

JUST WHO WILL HAVE RESPONSIBILITY FOR INTEGRATING AND SUPPORTING THESE TWO TECHNOLOGIES REMAINS TO BE SEEN, BUT IT DOES PRESENT NEW CAREER OPPORTUNITIES FOR THOSE WILLING TO TAKE THE REINS

Liz Filipiak would like nothing more than to be a full-time electronic data interchange (EDI) coordinator, but she says she does not see that happening any time soon.

As EDI coordinator/PC systems analyst at Spectrum Office Products, Inc. in Rochester, N.Y., Filipiak sets up the company's EDI links with its trading partners, programs applications interfaces and works with customers to establish EDI programs. "I wish I could be a full-time EDI person," she says, "but a lot of midsize companies are not making a big commitment to EDI."

Filipiak could get her wish sooner than she thinks. The integration of EDI and electronic mail is expected to create long-term opportunities for information systems professionals.

As the X.435 standard for EDI/E-mail integration solidifies, more companies will layer EDI on top of existing messaging or E-mail infrastructures, says Matthew Cain, program director at Meta Group, Inc.'s Workgroup Computing Strategies Service in Westport, Conn. "We're really looking for the maturity of the X.435 specification, and we're probably looking at 1996 before we see prototypes really roll out."

That gives IS professionals plenty of time to position themselves as leading contenders to oversee this project.

Typically, E-mail administrators have come from IS, whereas EDI coordinators have come from business departments. Analysts predict, however, that as EDI and E-mail merge, a new administrator will evolve. "A new [position] is forming," says Steve Saltwick, global program manager at Cupertino, Calif.-based Tandem Computers, Inc.'s electronic commerce unit. "It will start out as team leader of a pilot project."

Furthermore, those with strong data communications backgrounds, solid project management skills and an understanding of the company's business processes will be poised to take the helm.

Seneca Foods, Inc. in Pittsford, N.Y., has almost entirely eliminated paper from its customer relations. Here, responsibility for voice, E-mail and EDI lies with Lawrence Havens, director of sales administration.

Havens, who is also chairman of the Rochester EDI User Group, says he thinks IS can provide leadership for integration projects, but only if it is a strategic department within the company. "If it reports directly to the [chief executive officer] and is responsible for best practices standards, then IS could be an appropriate place for the responsibility to reside," he says.

One potential career in this area is the end-user liaison. Sue Bishop, director of the Boston Computer Society's networking user group and president of TIC Business Consultants in Chelsea, Mass., says one of her clients called the position a "technology specialist."

The individual worked for the company's purchasing department, served as a liaison to IS and ended up with his own staff because he investigated business problems and applied technology solutions. "He knew enough to be a bridge between the two," she says. "EDI/E-mail integration creates a consulting opportunity. And wherever consultants go, full-time positions follow."

IS professionals seeking these opportunities should adopt a re-engineering "state of mind," Havens suggests. ■

Goff is a free-lance writer in New York.

TECHNOLOGY HOMEWORK

- Study the emerging EDI and E-mail standards, particularly the X.400 communications protocol, the X.435 integration standard and the X.500 directory services standard.
- Develop expertise in wide-area networking and data conversion, including familiarity with the Internet and various messaging gateways.
- Shop the market to learn the various E-mail solutions.

BUSINESS HOMEWORK

- Understand the technology's impact. Look for re-engineering opportunities.
- Work on project management and team building skills. Establish yourself as team leader material.
- Establish a relationship with your company's purchasing manager. Learn about the business processes.
- Become familiar with the workflow of the inventory management, cash flow management, personnel, accounting, billing and customer service and support units of your company.

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America's Leading Corporations Advertise Their IS Positions In Computerworld. Shouldn't You?

A fresh start in software

One organization is breathing life into older skills and helping people find jobs in the software industry

By Valle Dwight

Lyne Loomis worked for 14 years as a systems programmer at Prime Computer, Inc. and GTE Corp. When a slumping economy took its toll, she was out of a job. Having worked mainly with proprietary systems for most of her life, Loomis needed to seriously update her skills. After two years of job hunting, she considered switching careers.

Her hopes lifted when she heard about the Massachusetts Computer Software Council, an organization that offers a program to retrain displaced workers from the hardware and defense industries to work in the state's growing software industry.

In partnership with the Massachusetts government and private industry, the six-month Software Council Fellowship program starts with a three-week class to orient the fellows to the small business environment.

"The software industry is a whole different world," says Joyce Plotkin, the Software Council's director. "Most of these people come from huge companies and must learn about small, entrepreneurial environments."

To qualify for the program, an unemployed worker must have at least eight years' experience in a computer, electronics or defense business. The fellows, who are paid a stipend of $350 per week, are then matched with a company for a five-month internship.

A success story

The fellowship program has graduated two classes; the third class is in progress. Of the 36 participants, approximately 20 have found jobs, Plotkin says. The most recent graduates will be tracked for the next few months.

Loomis, who participated in the pilot program, interned at Lotus Development Corp. in Cambridge, Mass., where she learned how to work with both Windows and OS/2.

"Being able to put those skills on my resume made all the difference," Loomis says. "That's what it took to open doors." Since then, She has found a job as an applications programmer at a small software firm specializing in fundraising systems.

Another success story is Warren Case, who graduated from the second class in April and immediately found work with his sponsor company, Credit Technologies in Waltham, Mass.

Before becoming a software quality assurance engineer, Case worked at Raytheon Co. on the Patriot missile project. Besides the work experience, Case found the program's guest speakers to be educational. "I felt privileged to be a part of it," he says.

Since the fellowship program received national attention last month, the Software Council has received a call from the state of California, which is considering a similar program.

"It's a godsend," Case says. "Every state should have one." ■

In 1989, there were 800 software companies in Massachusetts employing 46,000 people, according to Joyce Plotkin, director of the Massachusetts Software Council. By 1993, there were 1,600 companies employing 82,000 people. By 1996, 30,000 more software jobs are expected to be created in the Bay State.

Other options

While the Massachusetts Software Council fellowship program is believed to be the first of its kind, there are other programs across the country retraining workers. With grants from the state and federal government, Bryant College in Rhode Island, for example, has developed a program to help displaced workers start their own businesses. Although not limited to information systems professionals, the program has attracted many of its participants from the computer industry, says Cheryl Faria, program director.

Free to the unemployed, classes run for 17 weeks and include courses on how to write a business plan and get a business up and running.

So far the success rate has been over 90%, Faria says. One former participant, for example, started a business advising companies about buying computers, while another set up a hardware sales firm.

Tell us about it!

If you offer or have been involved in a similar program, we want to hear about it. Please contact Jodie Naze at (800) 343-6474, ext. 727 or fax her at (508) 875-8931.

Dwight is a free-lance writer in Northampton, Mass.

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Cautious improvement in Pittsburgh

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by Kate Colborn

The Pittsburgh job market for information systems professionals has definitely improved in the last year. Financial services firms in particular are booming, and there is activity in other industries, too.

Several large Pittsburgh firms have multiple openings. Perhaps the most active is Mellon Bank Corp., which recently acquired The Boston Co.

The consolidation of its IS operations in Pittsburgh, along with growth and technology changes, means Mellon will hire more than 100 IS professionals this year, says Marty Lippert, senior vice president at the company.

More than a year into introducing distributed systems throughout the firm, Mellon has openings at all levels. "The most difficult to find are people who have real experience on the networking side, who are Novell certified," he says. On the mainframe side, systems programmers with well-developed MVS, CICS and IMS skills are also a "a prize commodity," Lippert says.

Roadway Package System, Inc. has another growing IS operation. Gordon Bloom, vice president of IS, is currently looking for planners, data administrators and a Unix technical support person. Roadway uses a range of systems, including Unix boxes, IBM RS/6000s and 15 AS/400s. This year, Roadway has filled more than 50 new positions, but more specialists are still needed. In 1995, hiring will pick up across the board, Bloom says.

Another company seeking experience in midrange systems is Contraves, Inc., which moved its IS operations from an IBM mainframe to a VAX 18 months ago. The company needs a senior systems and database analyst, as well as a VAX manager with MVS and Unix experience, says Maureen Bertocci, manager of systems development and acting IS director. Experience in manufacturing is important. "I want somebody who knows what a bill of materials is," she says.

Legacy systems still viable

Unfortunately, with some notable exceptions, a well-founded conservatism is common at Pittsburgh companies. William Gillespie, vice president of financial and administrative systems at Allegheny General Hospital, may have a typical attitude: "We will move to a client/server environment when the needs of the corporation require it," he says. "We are not being pushed into giving up our mainframe systems and software without a good business reason."

Change is coming, though. Allegheny is installing a network of PCs to handle accounts payable. In the meantime, Gillespie has a couple of permanent slots to fill: a senior systems analyst and a senior programmer analyst with experience in CICS, VSAM and job control language.

Another factor dampening job growth is that some large companies have outsourced their data processing, says Bill Kinol, a recruiter at Robert Half International, Inc.'s Pittsburgh office.

One company that has taken up the slack is Genix Group, which handles IS for more than 50 large Pittsburgh firms. In fact, the job market looks good here. Genix is growing and is looking for systems and applications programmers with backgrounds in MVS, CICS and DB2, recruiter Janet Carol says. ■

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IS take-out

There are a number of opportunities at Pittsburgh companies. The catch is that many are not permanent.

The number of contracting firms, both local and national, doing business in Pittsburgh has increased 20% during the last three years, says Leslie Finkel, branch manager at Source Services' Pittsburgh office.

At Allegheny General Hospital, William Gillespie, vice president of financial and administrative systems, uses contractors at peak periods for application maintenance and enhancements.

U.S. Steel Group also uses contractors. In fact, according to one source, almost all of its recent permanent job offers were made to current contractors or in some cases, cooperative students.

And even though permanent hiring is strong at Mellon Bank, contractors are still important.

"We'll use our own programmers for conversion activity and have contractors fill in on some of the more routine stuff," says Marty Lippert, senior vice president at Mellon.

—Kate Colborn

Colborn is a free-lance writer in Center Harbor, N.H., who writes about technical careers.

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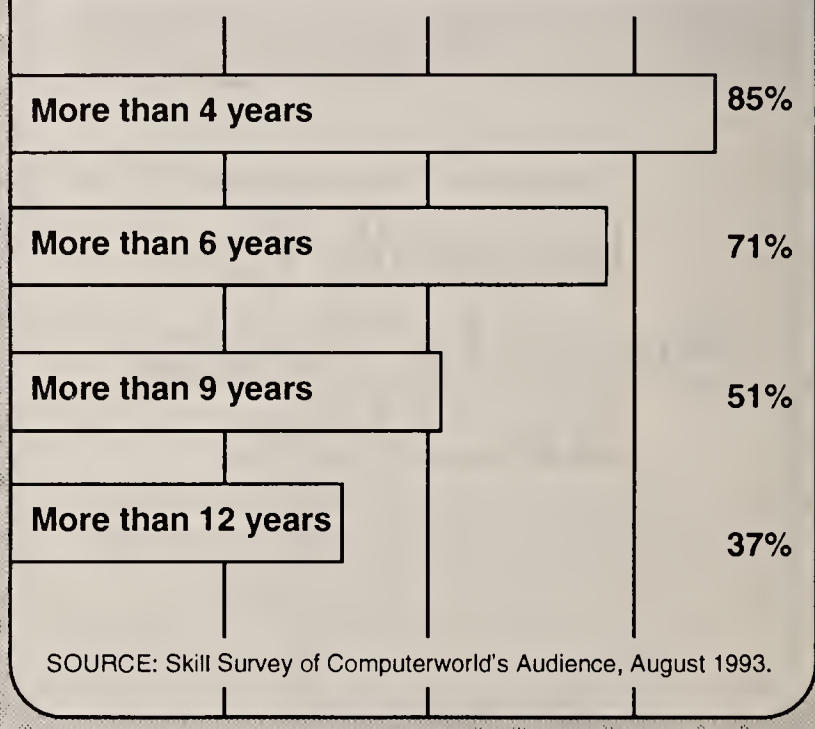

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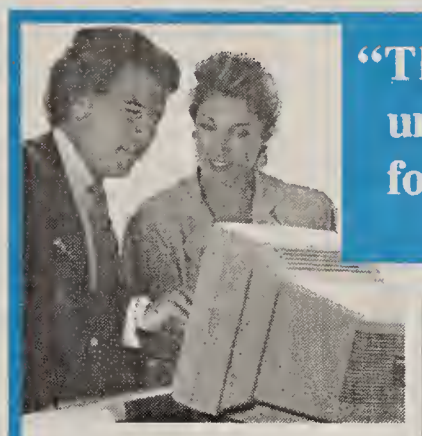

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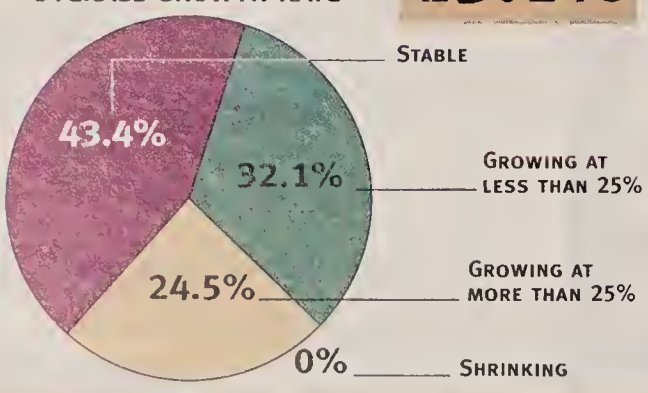

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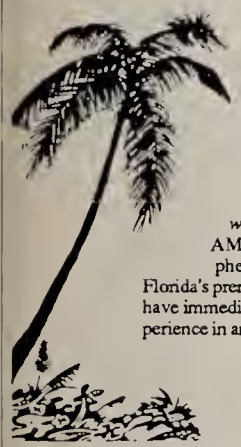

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Initial contract three years, with tax-free emoluments of approximately US$ 54,200 - p.a. Additional allowances for dependents, Travel and removal expenses paid. Assignments and repatriation grants. Six weeks annual leave. Applicants should send their detailed curriculum vitae quoting Vacancy Notice No. 94/023 to the **Division of Personnel, International Atomic Energy Agency, P.O. Box 100, Wagramerstrasse 5, A-1400 Vienna, Austria, before 20 August 1994.**

"...Computerworld Direct Response Cards consistently generate the highest profits of any deck we've tried."

- Mary Cooper
Vice President
cfSOFTWARE, Inc.

A software developer based in Chicago, cfSOFTWARE has been providing communications solutions to computer professionals in the IBM and compatible arena for over a decade. Because *Computerworld* appeals to a large base of both mainframe and PC professionals, Vice President Mary Cooper just recently expanded the company's *Computerworld Direct Response Card* advertising to include all three of their communications products.

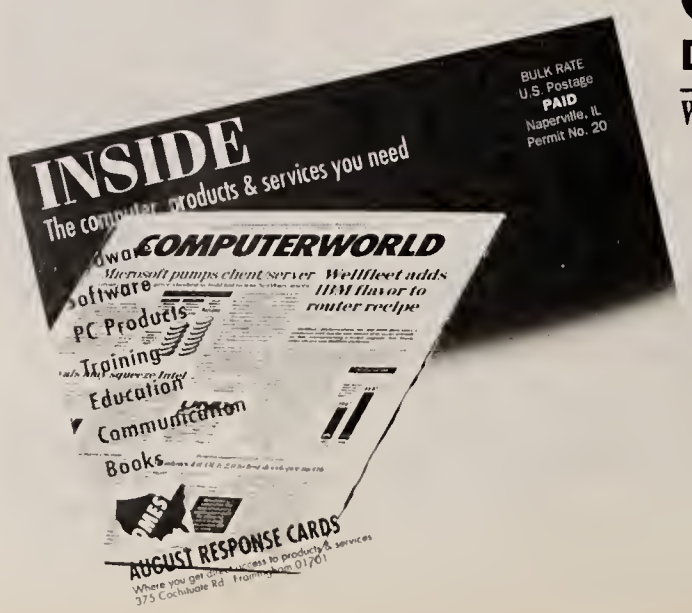
"To generate sales for Across the Boards, a communications toolkit for developing cooperative applications, and pcMAINFRAME, a generalized micro-to-mainframe file transfer system, cfSOFTWARE has been advertising in *Computerworld Direct Response Cards* almost from the very start. Now, based on our past success, we've also started to advertise pc2POWER, our newest file transfer system. Since all of our products facilitate mainframe-to-micro communication, we need to reach IS managers and technical support professionals on the mainframe side as well as end users on the PC side. That's why *Computerworld Direct Response Cards*, with their large audience of buyers most apt to need our products, are one of our primary advertising vehicles.

"Clearly, *Computerworld Direct Response Cards* take the 'hit or miss' out of advertising by qualifying our audience for us. We call it our high-profile deck because we not only get high visibility and a high rate of response but also convert a high volume of leads into sales. With their excellent cost per lead, *Computerworld Direct Response Cards* consistently generate the highest profits of any deck we've tried.

"In fact, we can always tell when our *Computerworld Direct Response Card* advertising hits because of the sudden surge in sales activity. Business really starts hopping with more phone calls and more mail. It's a real morale builder! But most importantly, every time we advertise in *Computerworld Direct Response Cards* we receive well over 100 leads. Sometimes we even get responses six months later, so we know *Computerworld Direct Response Cards* have a long shelf life that gives cfSOFTWARE valuable exposure for building awareness and share of mind over the long term.

"While reasonable rates for color and multiple insertions add considerable appeal, the large quantities of quality leads generated by every card we run is our key incentive for stepping up cfSOFTWARE's advertising schedule in *Computerworld Direct Response Cards*."

Computerworld Direct Response Cards give you a cost-effective way to reach a powerful buying audience of over 139,000 computer professionals in the U.S. They're working for cfSOFTWARE - and they can work for you. Call Norma Tamburrino, National Account Manager, Computerworld Direct Response Cards, at 201/587-8278 to reserve your space today.



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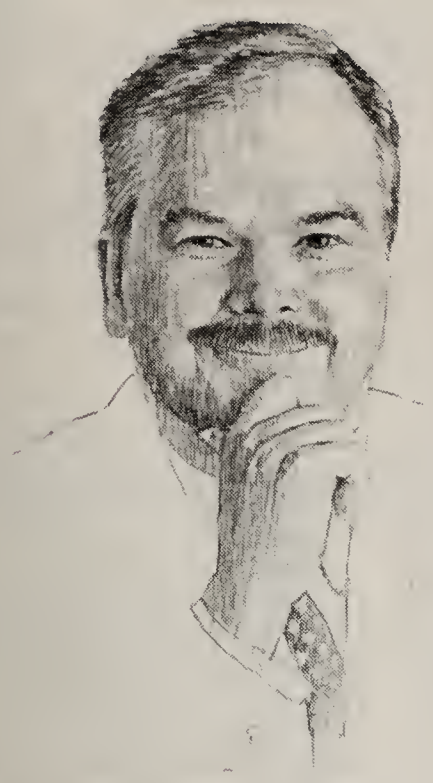

"In computer trade press advertising, Computerworld Direct Response Cards are first in quantity and quality - and lowest in cost per qualified lead."

- Charles A. Mills
President
Firesign Computer Company

Firesign Computer Company is a data communications software developer with 17 years in the business. Having tripled in size during the past two years, this San Francisco-based company retains rep firms on the East Coast and in Europe to service a worldwide customer base that extends as far as Australia and New Zealand. For President Chuck Mills, finding new sales prospects for the company's flagship product Outbound means advertising in *Computerworld Direct Response Cards* every month.

"Outbound's claim to fame is unattended file transfer. Supporting MVS and VM mainframes and OS/2, DOS, and Windows PC networks, it is the only product whose main thrust is unattended mainframe-to-PC file transfer. Virtually invisible to the PC user, Outbound saves time, provides flexibility, and eliminates training - all while automatically ensuring consistent reliability.

"By its very nature, Outbound has a cross-industry and cross-functional appeal, with potential users ranging from mainframe network software managers to information center professionals to project analysts. So when it comes to targeting our audience, we need a broad-spectrum advertising vehicle with a broad reader base. It's no surprise, then, that *Computerworld Direct Response Cards* have proven to be our best choice.

"In computer trade press advertising, *Computerworld Direct Response Cards* are first in quantity and quality - and lowest in cost per qualified lead. They consistently generate over 70 responses every month - and a full two-thirds are very qualified leads. Some months, we've even received as many as 120 responses. On a cost-per-lead basis, *Computerworld Direct Response Cards* are also our best value dollar-wise.

"As an added benefit, I see *Computerworld Direct Response Cards* having an equalizer effect. Here, unlike other advertising vehicles, companies with smaller advertising budgets like ours stand out and make just as big an impact as much larger companies. *Computerworld's* large circulation also gives us reach to the right cross-section of potential buyers. And, since we continue to receive responses for many weeks after each deck hits, we obviously benefit from both a long shelf life and an active pass-along readership.

"As long as *Computerworld Direct Response Cards* remain our top lead generator, we'll definitely maintain our advertising presence in every deck. Looking ahead, I also foresee expanding our *Computerworld Direct Response Card* advertising should we develop a new data communication software product requiring similar exposure."

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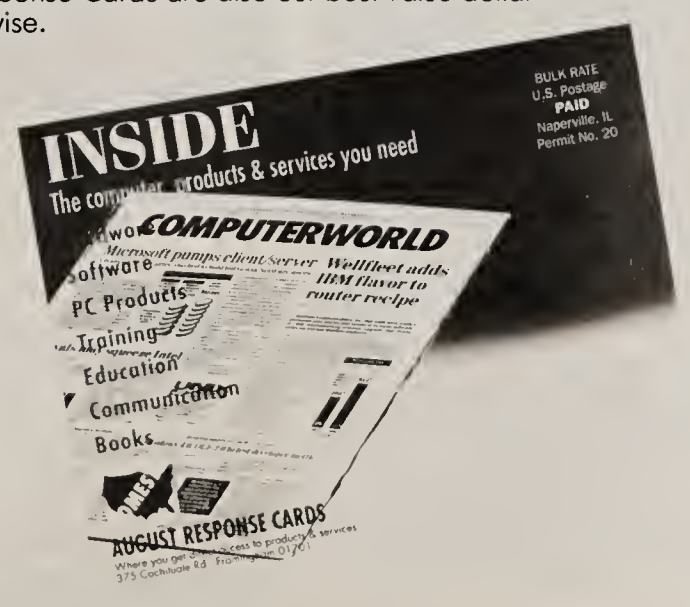

BUG WATCH

By MICHELLE LOUZOUN

THE MACHINE THAT CRIED WOLF

A bug in TabWorks 1.1, a program shell that organizes files in Microsoft Corp.'s Windows 3.1, makes users think that their disk drives are broken.

When a user working in TabWorks turns the machine off and then tries to get back into TabWorks, he will get the message "Error in Drive C. Machine can't read any data." "I get calls about this on a daily basis," says Toby Hudson, a technical support engineer at Compaq Computer Corp. in Houston.

VENDOR RESPONSE

XSoft in Palo Alto, Calif., has worked around this problem. "This is caused by not exiting Windows properly," says Kim Medrano, product manager. "We now provide a backup copy of the book file on hard disk just in case this happens." If a user gets the error message, he must answer "OK." The user can then call up the file manager, change the name of the backup file to the original file name and access his file by choosing "open book" on the menu.

THE CASE OF THE DISAPPEARING CURSOR

Users working with WordPerfect Corp.'s WordPerfect 6.0 who load Lotus Development Corp.'s 1-2-3 Version 4.0 or 4.01 for Windows may get a yellow cursor on the spreadsheet instead of a black one. The white background makes the yellow cursor invisible. "We get plenty of calls about this," says Mike Shelgren, a support representative at Corporate Software, Inc. in Canton, Mass. "People find it frustrating since they can't see where they are. It's like they lost their place."

VENDOR RESPONSE

"This bug has been reported to us," a Lotus spokesman says. "As with any report that comes in on a bug, we have a system to track it." In the meantime, users can resolve the problem by choosing a lower-resolution color driver or loading 1-2-3 before WordPerfect.

For more information on how to change the color driver or get the Lotus program to automatically start before WordPerfect, ask the company for the technical note on this subject.

WORKING IN A VACUUM

Imagine working on a document or spreadsheet only to find you have no place to store your files. If you're running Microsoft's DOS 6.x on Novell, Inc.'s NetWare 3.12, it could happen to you.

To allow DOS 6.x users to connect their workstations with a Novell server, Microsoft used the SETVER command to tell NETX it was running on DOS 5.0. This causes the use of incorrect application programming interface (API) calls and can cause the workstation to reload the wrong version of command.com when situations warrant it.

Some of the problems caused by the incorrect API calls include errors in program operations.

To get around this problem, first remove the LASTDRIVE=Z statement in config.sys on your PC. Then type SETVER NETX.EXE/D, press enter and reboot the system. If you are using the latest version of NETX.EXE from DOSUP9.EXE from CompuServe, this will let NETX see the correct version of DOS in use.

VENDOR RESPONSE

Microsoft purposely uses the SETVER command to deceive the workstation, says Bryan Thompson, a support engineer. That way, any DOS version can work with any Novell version. "Otherwise, we'd be penalizing customers who run Novell," he says. "The minute they buy an update to DOS, they'd be forced to run out and get an update to Novell."

MISSING PAGE BREAKS

Microsoft Excel users may find it harder to create spreadsheet presentations than it should be.

A bug in the software causes problems when users set up multiple page breaks. After the third or fourth break, the page delineations are no longer visible on the screen.

"If you want information on one division on one page and information about other divisions on other pages, you can't see how the spreadsheet will break on the screen," Shelgren says.

To see what will appear on a page, you must go into print preview. "The fact that you don't see any page breaks really spooks people," he adds.

VENDOR RESPONSE

"Our testers are now working to make sure the problem is reproducible in all cases," says Kirstin Larson, Excel product manager. "If it is, we will assign it a priority in our system that tracks bugs to be fixed in future releases."

To work around this problem, choose the tools section of the program and click "options" to get a dialog box. Select "view," then choose "show page breaks." These steps will turn the page breaks on automatically. ■

Louzoun is a free-lance writer in New York.

BUG US!

If you've come across a new bug and (even better) found your own solution, we want to hear about it. Call Jodie Naze at (800) 343-6474, ext. 727, or fax to (508) 875-8931.

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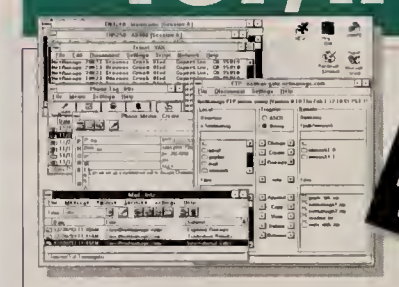

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For No Charge RFP's call Linda Watkins @ 601-359-2604. CDPA reserves the right to reject and/all bids and to waive informalities.

Bids / Proposals

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NOTICE OF SOLICITATION

CONTRACT #: 93L5049
Proposal Closing Data: Monday, July 25, 1994 at 2 PM local time.
TITLE: Develop, Furnish, Deliver, Install and Maintain a Wide Area Multiprotocol Router Communication Network.

A Pre-proposal Conference Scheduled on June 30, 1994, 10:00 A.M., at 130 Livingston Street, Conference Room 5 & 6, on 6th Floor, Brooklyn, N.Y. 11201. Prospective bidders who desire to attend shall notify the Procurement Manager no later than noon of the day prior to the scheduled event.

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NEW YORK CITY TRANSIT AUTHORITY
NOTICE OF SOLICITATION
CONTRACT #CMM0903

Proposal Closing Data: Tuesday, July 12, 1994 at 2PM local time
TITLE: Consultant Services for Customization and Installation of The Dunn & Bradstreet Series "M" General Ledger 3.0 Software Package.

A Pre-proposal Conference Scheduled on June 23, 1994, 10:00 A.M., at 130 Livingston St, Conference Rm 3 & 4, on 6th Flr, Brooklyn, NY 11201. Prospective bidders who desire to attend shall notify the Procurement Specialist no later than noon of the day prior to the scheduled event.

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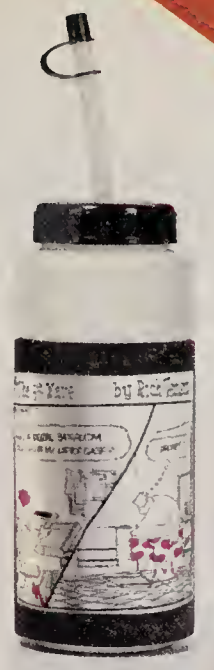

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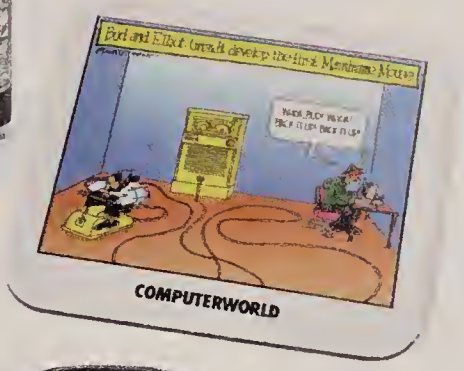

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Scene Three, Inc. 75
Scott Paper Co. 1
Sears, Roebuck and Co. 85
Seneca Foods, Inc. 133
Sequent Computer Systems, Inc. 10
Serena International 105
Servio Logic Corp. 107
SHL Systemhouse, Inc. 85,107
Silicon Graphics, Inc. 16,24,45,78
Smart Technologies, Inc. 30
Software Interfaces, Inc. 81
Software 2000 158
Solomon Software 110
Spectrum Office Products, Inc. 133
Sprint Corp. 85
SPS Transaction Services, Inc. 155
Spyglass, Inc. 45
Stac Electronics 10
Storage Technology Corp. 6
Strategic Mapping, Inc. 45
Strategic Networks Consulting, Inc. 12,78,85
Summit Strategies, Inc. 8,16
Sun Microsystems, Inc. 16,24,30 75,78,95,102
SunGard Data Systems, Inc. 1
SunSoft, Inc. 24,36,75,81
Swiss Bank Corp. 24
Sybase, Inc. 4,10,75,107,108,158
Symantec Corp. 33,89
Synernetics, Inc. 85
SynOptics Communications, Inc. 10,85

T

Taligent, Inc. 107,158
Tandem Computers, Inc. 133
Tatung Corp. 36
Telecommunications Techniques Corp. 92
Tele-Communications, Inc. 137
Texaco, Inc. 75
Texas Instruments, Inc. 20
The Boston Co. 138
The DiBianca-Berkman Group, Inc. 36
The Diebold Group, Inc. 96
The Tower Group 96
Thinking Machines Corp. 16
TIC Business Consultants 133
Tosco Northwest Co. 1
Toshiba Corp. 16
Trawick & Associates 1
Trinzic Corp. 108

U

Ungermann-Bass, Inc. 85
UniSQL, Inc. 107
Unisys Corp. 102
US West 137

V

Vanstar Corp. 8
Versant Object Technology Corp. 108

W

Wells Fargo Bank 75
Wessex, Inc. 45
Weyerhaeuser Co. 75
WordPerfect Corp. 1,6,75,146

X

XBD Systems, Inc. 81
Xerox Corp. 30
XSoft 146

Gainers

Percent

Walker Interactive Systems	32.1	Merisel	-40.6
Quarterdeck Office Sys.	28.0	CompUSA Inc.(L)	-22.9
Creative Technologies Inc.	17.6	Intelligent Electronics	-22.0
Hogan Systems Inc.	10.8	Filenet Corp.	-19.8
Software Publishing Corp.	10.3	Gandalf Technologies Inc.(L)	-17.9
SEI Corp.	9.6	Cray Computer	-17.4
Microcom Inc.	9.5	Micropolis Corp.	-17.3
Shared Medical Systems	8.3	Parallan Computer(L)	-14.8

Dollar

Creative Technologies Inc.	2.69	Cabletron Systems	-7.25
Paychek	2.25	Merisel	-7.00
Walker Interactive Systems	2.25	8MC Software Inc.	-6.50
Bellsouth Corp.	2.13	Xilinx	-6.13
Bell Atlantic Corp.	1.88	Texas Instruments	-6.13
Shared Medical Systems	1.88	Powersoft	-5.75
Sungard Data Systems	1.75	Filenet Corp.	-5.38
SEI Corp.	1.75	Cirrus Logic	-5.13

LAST WEEK, RESELLERS MERISEL, INC. AND COMPUSA, INC. BOTH WARNED OF EARNINGS SHORTFALLS AND A SLOWDOWN OF THE OVERALL DOMESTIC COMPUTER MARKET. SEMICONDUCTOR STOCKS DROPPED OVER CONCERNS ABOUT THE MAY BOOK-TO-BILL RATIO, WHICH WAS ANNOUNCED THURSDAY AND MATCHED GENERAL EXPECTATIONS.

Industry Almanac

An automation upswing

Whether the current vision of the 500-channel, interactive multimedia information superhighway ever comes to pass, there are some companies already reaping rewards from the gradual move to electronic commerce.

Automated transactions — credit card purchases, electronic health care claims, electronic data interchanges and the like — are on the upsurge, according to a report from Alex. Brown & Sons, Inc. Analysts at the Baltimore-based investment banking company peg the number of automated transactions last year at 25.3 billion. That total should swell to 59 billion by the turn of the century, making for healthy business for transaction processing companies.

Bank card processors such as **First Data Corp.** (FDC) and **First Financial Management Corp.** (FFM) currently earn the bulk of the revenue from automated transactions. Financial services accounted for 96% of all electronic transactions last year.

However, Alex. Brown forecasts explosive growth for other forms of electronic commerce. Point-of-sale debit, health care claims, benefits transfers and third-party automated teller machine transactions will grow from about 1 billion in 1993 to more than 25 billion by the year 2000. The beneficiaries will include smaller companies such as **Medaphis Corp.** (MEDA) and **SPS Transaction Services, Inc.** (PAY).

Transaction processing stocks have done well in the past year, but they still trade at low prices relative to their projected earnings for 1995, according to the report.

—Derek Slater

RAGING BULL

Alex. Brown & Sons analysts like the prospects of many players in the transaction processing services sector

Recommendation: Strong buy	Recommendation: Buy
Envoy	Concord EFS
First Financial Management	Electronic Data Systems
Medaphis	First Data
SPS Transaction Services	QuickResponse Services
Sterling Software	

Exch	52-Week Range			June 10 3PM	Wk Net Change	Wk Pct Change
Communications and Network Services						**OFF 2.95%**
OTC	63.75	19.63	3 COM Corp.	44.25	-1.50	-3.3
NYS	45.56	36.25	AMERITECH Corp.	41.13	1.38	3.5
NYS	65.00	49.50	AT&T	55.38	-0.38	-0.7
OTC	26.50	13.00	Banyan Systems Inc.	15.75	0.44	2.9
NYS	69.13	49.00	Bell Atlantic Corp.	56.25	1.88	3.4
NYS	63.88	53.00	Bellsouth Corp.	62.00	2.13	3.5
NYS	21.50	5.88	Bolt, Beranek & Newman	12.38	0.00	0.0
OTC	15.75	9.50	Brooktrout Technology	12.00	0.00	0.0
NYS	132.50	87.25	Cabletron Systems	87.25	-7.25	-7.7
OTC	43.00	17.75	Centigram Communications	22.50	-0.38	-1.6
OTC	60.25	35.00	Chipcom Corp.	35.00	-2.75	-7.3
OTC	40.75	20.13	Cisco Systems Inc.	23.38	-1.00	-4.1
OTC	18.38	9.25	Compression Labs Inc.	11.00	-0.63	-5.4
OTC	12.38	5.38	Computer Network Tech.	7.13	-0.50	-6.6
OTC	33.75	8.50	CrossComm	9.38	-1.63	-14.8
OTC	3.38	1.50	Data Switch Corp.	2.13	0.00	0.0
OTC	36.56	19.00	DSC Communications (L)	21.25	-1.00	-4.5
OTC	3.50	0.50	Gandalf Technologies Inc. (L)	0.50	-0.11	-17.9
NYS	17.63	8.00	General Datacomm Inds.	14.50	-0.63	-4.1
NYS	39.88	29.50	GTE Corp.	31.88	0.25	0.8
NYS	95.97	74.78	ITT Corp.	83.00	-2.13	-2.5
OTC	29.88	21.38	MCI Commmunications Corp.	24.38	0.38	1.6
OTC	7.75	1.50	Microcom Inc.	5.75	0.50	9.5
OTC	23.50	11.50	NetManage Inc.	14.00	-2.38	-14.5
OTC	7.25	3.50	Netrix Corp.	5.00	0.00	0.0
OTC	10.25	4.25	Network Computing Devices (L)	4.50	-0.50	-10.0
NYS	11.13	6.63	Network Equipment Tech.	8.00	-0.13	-1.5
OTC	23.38	8.88	Network General	17.50	-0.63	-3.4
OTC	9.88	6.38	Network Systems Corp.	6.75	0.00	0.0
OTC	73.88	37.75	Newbridge Networks Corp. (L)	39.00	-1.38	-3.4
NYS	38.63	21.38	Northern Telecom Ltd.	31.00	0.00	0.0
OTC	29.25	15.38	Novell Inc.	16.94	-1.31	-7.2
NYS	48.88	33.25	Nynex Corp.	38.88	1.50	4.0
OTC	30.00	18.75	Octel Communications Corp.	19.75	-0.13	-0.6
OTC	18.25	9.00	Optical Data Systems Inc.	14.50	-0.50	-3.3
OTC	7.50	3.75	Penril Data Comm Networks	3.88	-0.19	-4.6
OTC	27.25	10.00	Picturetel Corp.	13.13	-1.13	-7.9
OTC	8.25	3.63	Proteon Inc.	5.63	-0.25	-4.3
OTC	14.38	5.88	Racotek Inc.	6.75	-0.25	-3.6
NYS	38.88	24.88	Scientific Atlanta Inc.	34.75	-2.38	-6.4
NYS	47.00	36.75	Southwestern Bell Corp.	43.38	1.13	2.7
NYS	40.25	30.25	Sprint Corp.	39.00	0.13	0.3
OTC	26.75	14.50	Standard Microsystems Corp.	17.13	-0.38	-2.1
OTC	23.75	10.75	Stratacom Inc.	22.50	0.50	2.3
OTC	40.75	15.50	Synoptics Communications (L)	16.50	0.44	2.7
OTC	15.25	2.88	Telebit Corp.	5.13	-0.25	-4.7
OTC	46.00	21.00	US Robotics	27.75	-4.00	-12.6
NYS	50.75	38.25	US West Inc.	41.88	1.13	2.8
OTC	43.88	19.38	Wellfleet Communications	24.50	-0.75	-3.0
OTC	28.25	13.50	Xircom	16.25	-2.00	-11.0
OTC	30.00	13.75	Xyplex Inc.	14.38	-0.88	-5.7
PCs and Workstations						**OFF 4.52%**
OTC	7.50	2.63	Advanced Logic Research	4.69	0.19	4.2
OTC	58.25	22.00	Apple Computer Inc.	27.13	-0.88	-3.1
OTC	33.00	13.75	AST Research Inc.	15.13	-1.50	-9.0
NYS	39.88	14.38	Compaq Computer Corp.	35.25	-3.92	-10.0
OTC	30.75	13.50	Dell Computer Corp. (H)	27.75	-1.88	-6.3
OTC	25.00	12.38	Gateway 2000 Inc.	14.13	-0.75	-5.0
NYS	93.63	64.38	Hewlett Packard Co.	76.50	-2.75	-3.5
NYS	26.88	16.00	Silicon Graphics	20.63	-1.63	-7.3
OTC	32.63	19.75	Sun Microsystems Inc.	20.25	-1.13	-5.3
NYS	50.75	28.13	Tandy Corp.	36.13	-1.63	-4.3
OTC	5.13	2.38	Zeos International Ltd.	2.50	0.00	0.0
Large Systems						**OFF 2.04%**
ASE	7.88	4.38	Amdahl Corp.	6.50	0.38	6.1
NYS	7.63	3.63	Convex Computer	4.63	0.00	0.0
OTC	4.50	0.50	Cray Computer	1.19	-0.25	-17.4
NYS	33.75	19.13	Cray Research Inc.	21.13	-0.13	-0.6
NYS	10.75	6.63	Data General Corp.	7.50	-0.13	-1.6
NYS	43.25	18.25	Digital Equipment Corp.	20.13	-0.50	-2.4
NYS	52.25	36.38	Harris Corp.	47.13	-0.63	-1.3
NYS	64.13	40.63	IBM	62.63	1.50	2.5
OTC	25.75	2.75	Kendall Square Research	3.25	0.00	0.0
OTC	18.75	8.25	NetFrame	10.25	0.50	5.1
OTC	26.00	5.00	Parallan Computer (L)	5.75	-1.00	-14.8
OTC	23.25	6.50	Pyramid Technology	7.25	-0.75	-9.4
OTC	20.00	11.13	Sequent Computer Sys.	14.94	0.56	3.9
OTC	6.84	1.75	Sequoia Systems Inc.	3.75	-0.31	-7.7
NYS	33.25	20.25	Stratus Computer Inc.	29.63	-0.38	-1.3
NYS	16.38	8.50	Tandem Computers Inc.	12.75	0.75	6.3
OTC	30.00	9.75	TriCoro Systems	13.25	-0.25	-1.9
NYS	16.50	9.88	Unisys Corp.	10.63	-0.25	-2.3
Software						**OFF 3.00%**
OTC	37.00	16.25	Adobe Systems Inc.	27.50	-1.50	-5.2
OTC	34.50	13.50	Alous Corp.	25.50	-2.25	-8.1
OTC	8.38	4.50	American Software Inc.	5.13	0.25	5.1
OTC	15.75	6.75	Ask Computer Systems	13.00	0.00	0.0
OTC	61.75	37.00	Autodesk Inc.	49.75	-2.00	-3.9
OTC	4.50	2.06	Bachman Info. Systems	2.13	-0.25	-10.5
OTC	34.00	20.50	BGS Systems Inc.	24.00	0.25	1.1
OTC	71.00	44.50	BMC Software Inc.	52.00	-6.50	-11.1
OTC	30.25	22.50	Boole & Babbage (H)	29.00	-1.00	-3.3
OTC	25.25	8.50	Borland Int'l Inc.	9.00	-0.25	-2.7
OTC	25.00	9.50	Brock Control Systems Inc.	22.00	1.00	4.8
OTC	4.63	2.38	CE Software	3.13	-0.13	-3.8
ASE	30.34	16.91	Cheyenne Software Inc.	17.38	-0.75	-4.1
OTC	14.25	6.25	Cognos Inc.	11.75	0.50	4.4
NYS	44.88	27.00	Computer Associates	40.13	-1.25	-3.0
NYS	5.38	2.13	Computervision Corp.	3.25	-0.50	-13.3
OTC	48.25	21.00	Compuware Corp.	39.50	-3.75	-8.7
OTC	14.00	5.75	Comshare Inc.	13.00	0.25	2.0
OTC	25.00	7.63	Corel Corp. (H)	23.56	-1.19	-4.8
OTC	7.75	3.38	Easel Corp.	4.00	0.25	6.7
OTC	29.25	11.00	Filenet Corp.	21.75	-5.38	-19.8
OTC	25.00	4.50	4th Dimension	5.25	0.13	2.4
OTC	12.50	5.25	Frame Technology	10.13	-1.13	-10.0
OTC	13.00	7.00	Group I Software	7.00	-0.25	-3.4
OTC	31.75	10.75	Gupta (L)	10.75	-1.00	-8.5
OTC	12.00	7.25	Hogan Systems Inc.	10.25	1.00	10.8
OTC	29.50	16.00	IMRS	25.13	-0.63	-2.4
OTC	44.75	12.50	Information Resources	14.75	-0.25	-1.7
OTC	27.25	14.25	Informix Corp.	17.00	1.00	6.3
OTC	12.38	8.50	Intergraph Corp.	9.31	0.06	0.7
OTC	9.13	4.88	Interleaf Inc.	6.13	0.00	0.0
OTC	15.50	4.75	Intersolv Inc.	11.75	0.13	1.1
OTC	50.00	27.00	Intuit Inc.	32.25	-3.25	-9.2
OTC	18.75	8.00	Knowledgeware Inc. (L)	8.75	-0.63	-6.7
OTC	37.00	15.50	Legent Corp.	30.25	-1.75	-5.5
OTC	86.50	30.25	Lotus Development	55.06	-3.31	5.7
OTC	18.50	8.50	Magic Software Enterprises (L)	8.50	-1.00	-10.5
OTC	18.50	6.00	Manugistics Group Inc.	7.75	-1.25	-13.9
OTC	10.00	3.63	MathSoft	4.50	0.00	0.0
OTC	11.25	4.50	McAfee Associates	7.75	-0.50	-6.1
OTC	17.25	8.38	Mentor Graphics	10.38	-0.50	-4.6
OTC	34.88	11.50	Micro Focus	18.13	-0.88	-4.6
OTC	11.63	4.75	Micrografx Inc.	6.13	-0.63	-9.3
OTC	54.63	35.19	Microsoft Corp. (H)	52.75	-0.25	0.5
OTC	38.25	21.19	Oracle Corp. (H)	36.25	-1.75	-4.6
OTC	44.75	23.75	Parametric Technology	26.38	-3.38	-11.3
OTC	24.50	15.50	ParcPlace Systems Inc.	18.50	-1.50	-7.5
OTC	41.38	26.00	Peoplesoft	33.50	-1.75	-5.0
OTC	6.25	3.50	Phoenix Technologies	5.00	0.00	0.0
OTC	69.50	24.25	Powersoft	54.25	-5.75	-9.6
OTC	39.75	3.50	Platinum Software	5.94	-0.00	-0.0
OTC	14.75	7.25	Platinum Technology	12.75	-0.63	-4.7
OTC	60.25	32.50	Progress Software Corp. (L)	32.50	-2.00	-5.8
OTC	4.00	1.94	Quarterdeck Office Sys.	4.00	0.88	28.0
OTC	32.00	13.00	Rainbow Technologies Inc.	13.75	-0.88	-6.0
OTC	11.38	4.00	Rasterops	4.38	-0.63	-12.5
OTC	14.50	3.75	Ross Systems	4.25	-0.38	-8.1
OTC	28.75	3.88	Sapiens Intl. Corp. N.V.	4.38	-0.63	-12.5
OTC	14.00	9.75	Softkey International Inc.	13.75	1.00	7.8
OTC	8.63	3.75	Software Publishing Corp.	5.38	0.50	10.3
OTC	17.25	7.75	Software Toolworks Inc.	14.50	0.00	0.0
OTC	13.75	6.00	State of the Art	6.00	-1.00	14.3
NYS	35.63	17.63	Sterling Software Inc.	33.25	-0.88	-2.6
OTC	21.63	9.13	Struct. Dynamics Research (L)	9.69	-0.81	-7.7
OTC	56.75	25.75	Sybase Inc.	52.50	-2.00	-3.7
OTC	20.50	10.88	Symantec Corp.	12.88	-1.13	-8.0
OTC	52.75	33.75	Synopsys	40.13	-2.38	-5.6
OTC	24.25	11.75	System Software Assoc.	15.00	0.00	0.0
OTC	6.75	2.88	Trinzic Corp.	4.38	-0.13	-2.8
OTC	30.00	16.50	ViewLogic Systems	20.00	0.50	2.6
OTC	13.25	5.50	Walker Interactive Systems	9.25	2.25	32.1
OTC	60.00	17.50	Wall Data Inc.	37.88	-1.88	-4.7
Semiconductors						**OFF 5.07%**
NYS	32.75	16.75	Advanced Micro Devices	26.75	-2.25	-7.8
NYS	31.13	18.63	Analog Devices Inc.	27.38	-2.13	-7.2
OTC	29.63	10.94	Atmel Corp.	26.88	-2.25	-7.7
OTC	7.50	3.38	Chips and Technologies	4.75	0.00	0.0
OTC	44.63	15.75	Cirrus Logic	31.25	-5.13	-14.1
NYS	19.88	11.25	Cypress Semiconductor Corp.	16.88	-0.25	-1.5
NYS	20.13	13.00	Dallas Semiconductor (H)	19.38	-0.50	-2.5
OTC	27.75	19.25	Integrated Silicon Systems (L)	21.00	1.50	7.7
OTC	74.50	49.25	Intel Corp.	59.88	-4.25	-6.6
NYS	26.38	13.00	LSI Logic Corp. (H)	23.75	-1.63	-6.4
OTC	26.75	12.25	Lattice Semiconductor	17.88	-1.25	-6.5
NYS	39.91	12.75	Micron Technology	33.13	-2.88	-8.0
NYS	54.88	40.31	Motorola Inc.	45.88	-2.25	-4.7
NYS	25.00	14.38	National Semiconductor	19.88	-1.13	-5.4
OTC	10.13	6.50	Sierra Semiconductor	8.06	0.19	2.4
NYS	89.50	55.75	Texas Instruments	76.88	-6.13	-7.4
OTC	18.88	7.63	VLSI Technology	14.63	-0.88	-5.6
OTC	14.38	3.38	Weitek	4.25	-0.13	-2.9
ASE	20.38	3.63	Western Digital Corp.	13.75	-1.00	-6.8
OTC	59.75	29.75	Xilinx	39.63	-6.13	-13.4
OTC	40.75	22.00	Zilog Inc.	33.50	-0.75	-2.2
Peripherals and Subsystems						**OFF 3.28%**
OTC	30.50	16.50	American Power Conversion	20.75	-1.50	-6.7
OTC	24.75	17.13	Banctec Inc.	21.50	-1.00	-4.4
OTC	7.75	3.25	Cambex Corp.	4.25	0.03	0.7
ASE	8.25	2.63	Cognitronics Corp.	3.00	0.13	4.3
NYS	20.50	9.00	Conner Peripherals	13.88	-1.13	-7.5
OTC	19.63	8.75	Creative Technologies Inc.	18.00	2.69	17.6
OTC	20.25	4.75	Data Race Inc.	5.88	-0.88	-13.0
ASE	10.75	4.13	Dataram Corp.	4.38	0.00	0.0
NYS	23.00	8.50	EMC Corp.	14.50	-1.75	-10.8
OTC	8.25	3.13	Emulex Corp.	6.38	0.38	6.3
OTC	21.00	14.25	Evans & Sutherland	15.00	-0.50	-3.2
OTC	22.50	7.50	Exabyte	16.00	-1.25	-7.2
OTC	34.00	6.00	Intelligent Info. Systems (L)	6.25	-0.38	-5.7
OTC	4.38	2.00	Iomega Corp.	2.25	0.00	0.0
OTC	9.75	5.75	IPL Systems Inc.	5.75	-0.50	-8.0
OTC	28.50	13.75	Komag Inc.	19.75	-3.25	-14.1
OTC	8.63	4.38	Maxtor Corp.	5.88	0.06	1.1
OTC	8.75	4.88	Micropolis Corp.	5.38	-1.13	-17.3
OTC	22.50	10.00	Pinnacle Micro Inc.	16.00	0.50	3.2
OTC	9.75	6.25	Printronix Inc.	9.75	0.00	0.0
NYS	11.75	7.38	QMS Inc.	7.88	-0.13	-1.6
OTC	20.25	9.38	Quantum Corp.	13.81	-2.19	-13.7
OTC	9.13	3.25	Radius Inc.	5.06	-0.19	-3.6
NYS	17.75	8.38	Recognition International (L)	9.13	0.25	2.8
OTC	6.88	3.63	Rexon Inc.	5.88	0.13	2.2
OTC	28.75	14.38	Seagate Technology	22.25	-1.19	-5.1
NYS	41.63	23.75	Storage Technology	30.25	-2.50	-7 6
NYS	33.38	21.38	Tektronix Inc.	28.50	-0.75	-2.6
NYS	104.88	69.88	Xerox Corp.	102.75	-1.13	-1.1
Services						**OFF 4.08%**
OTC	23.50	14.88	American Mgmt. Systems (H)	22.38	-0.75	-3.2
NYS	4.25	2.38	Anacomp Inc.	3.25	0.13	4.0
OTC	23.50	14.50	Analysts Int'l	16.25	-0.50	-3.0
NYS	56.88	46.88	Auto Data Processing	53.88	0.88	1.7
OTC	18.25	9.25	Cambridge Tech. Partners	16.88	-0 50	-2.9
NYS	24.88	14.00	Cerioian Corp.	24.00	-0.63	-2.5
NYS	24.25	14.00	Comoisco Inc.	20.75	-0.50	-2.4
OTC	12.50	4.84	Computer Horizons	9.25	-1.00	-9.8
NYS	44.00	25.25	Computer Sciences	42.13	-1.25	-2.9
NYS	9.00	6.00	Computer Task Group	9.00	0.00	0.0
NYS	34.75	9.25	CompUSA Inc. (L)	9.25	-2.75	22.9
OTC	13.50	7.75	Control Data Systems Inc.	11.00	0.00	0.0
OTC	11.00	6.63	Egghead Discount Software	7.25	-0.38	-4 9
NYS	38.00	26.00	General Motors E (EDS)	33.63	-1.63	-4.6
OTC	22.75	10.50	Inacom Corp	12.50	-1.00	-7.4
OTC	28.00	12.25	Intelligent Electronics	17.75	-5.00	-22.0
OTC	22.50	10.25	Merisel	10.25	7.00	-40.6
OTC	32.50	8.66	Microage Inc.	22.00	-3.75	14.6
OTC	40.50	25.66	Paychex	33.50	2.25	7.2
NYS	39.75	21.63	Policy Management Sys.	33.63	0.38	1.1
NYS	24.88	17.88	Reynolds and Reynolds	24.63	1.00	4.2
OTC	28.50	15.13	SEI Corp.	20.00	1.75	9.6
OTC	29.38	17.50	Shared Medical Systems	24.50	1.88	8.3
OTC	11.25	5.63	SHL Systemhouse	7.38	0.38	5.4
OTC	30.75	10.25	Software Spectrum Inc.	10.25	-1.00	-8.9
OTC	42.75	29.25	Sungard Data Systems	37.00	1.75	5.0

KEY: (H) = NEW ANNUAL HIGH REACHED IN PERIOD (L) = NEW ANNUAL LOW REACHED IN PERIOD

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WordPerfect reshaping suite

CONTINUED FROM PAGE 1

that will be tightly integrated, the sources said. In this case, users will be charged only for the applications they choose to deploy, not for the entire suite.

Lotus' suite includes minor upgrades to Ami Pro and revamps of the Approach 3.0 database and 1-2-3 Version 5.0. Meanwhile, Microsoft Corp. plans to deliver an interim release of Office with Lotus Notes integration in the same time frame.

Most unique contender

However, among the three contenders, WordPerfect will roll out the most dramatically different suite. The suite will include Object Linking and Embedding (OLE) 2.0-compliant versions of WordPerfect, Quattro Pro, InfoCentral Personal Information Manager and the WordPerfect Presentations graphics package.

With the exception of the client for the Symmetry messaging application, formerly known as WordPerfect Office, the suite represents the first grouping of OLE-compliant desktop applications to hit the market.

Sources said negotiations are currently under way to allow WordPerfect to include applications such as Borland's dBase, AutoDesk, Inc.'s AutoCAD and applications from Intel Corp. as integrated product options.

The integration among the different applications is made possible through WordPerfect's PerFectfit technology. Somewhat similar to Microsoft's Office Compatible API, the technology enables new applications from independent software vendors as well as users to be integrated with the WordPerfect suite.

Big boost for users

"This new concept would make things infinitely easier for us," said John Chamberlin, a superintendent of system and coordination at Tosco Northwest Co. in Ferndale, Wash. Currently, Tosco is standardized on Lotus' SmartSuite, but it still has a 20% population of WordPerfect users. Its sister company has standardized on Microsoft's Office.

"We're considering offering a cafeteria-style application offering for all of our users and just letting them pick and choose," Chamberlin said. "But we have some fear and trepidation about doing it. If WordPerfect can actually pull off this type of application integration, we would reconsider them as an application suite."

"The most intriguing part of [WordPerfect's] suites is interoperability," said Andreas Bode, a programmer at Price Waterhouse in Menlo Park, Calif.

WordPerfect is also positioned to outpace Microsoft and Lotus by offering a suitewide application programming language. Both the WordPerfect suites and Lotus' SmartSuite will include improved management capabilities. For example, the Symmetry component in the WordPerfect suite will include an agent that allows the suite to be managed by the Symmetry server console.

The Lotus suite will offer new management capabilities by providing end-user help facilities in the suite. This will let IS sites build help utilities designed for the applications and needs of end users.

Lotus also plans to roll out a Startup Desktop feature, which will work with SmartSuite 3.0 but will not be included with the new suite. The Startup Desktop consists of prebuilt templates that work as extensions to Lotus' personal productivity applications, as well as Notes. The Startup Desktop will also be available in the third quarter.

Lotus has not yet determined whether it will bundle the feature in SmartSuite or sell it separately.

Countdown for new suite lineup

	WordPerfect suite	Microsoft Office 4.2, 4.3	Lotus SmartSuite 3.0
Packaging	Two shrink-wrapped, one CD-ROM	Two shrink-wrapped	One shrink-wrapped
Basic components	WordPerfect 6.1 Quattro Pro 6.0 Information Central PIM Presentation Graphics Symmetry mail	Word 6.0 Excel 5.0 PowerPoint 4.0 Mail 3.2	Ami Pro 3.1 1-2-3 Version 5.0 Approach 3.0 Freelance 2.0 Organizer 1.1
OLE 2.0 support	All applications except Symmetry will support OLE 2.0	Excel, Access support OLE 2.0 on desktop	Approach has OLE 2.0
Notes/FX support	Yes	Yes	Yes
Pricing	"Competitively priced"	$750	"Competitively priced"
Availability	Third quarter	Third quarter	Third quarter

IBM seeks repeal

CONTINUED FROM PAGE 1

ern District of New York (in New York City), IBM asked 84-year-old judge David Edelstein — the same judge who presided over the 1956 agreement between the U.S. Department of Justice and IBM — for permission to file motions to terminate the decree and to remove Edelstein from the case.

After balking, Edelstein granted permission for both motions. As of press time, IBM had filed for the judge's removal but had not yet filed for termination of the decree.

Among the concerns addressed by the 1956 decree was that IBM was using its dominance as a hardware supplier to control the computer services business. The decree stipulated that IBM could provide services only through a separate subsidiary not bearing the IBM name and receiving no special pricing from IBM.

IBM argues that the Consent Decree is an anachronism because IBM no longer dominates the industry as it did 38 years ago. Also, the industry has dramatically shifted away from its old mainframe orientation.

"It's a complex issue," said Eric Singleton, director of information technology at the Orange County Property Appraiser's Office in Orlando, Fla. "The Consent Decree was written in another time, and it could probably stand at the very least a very close review, given today's 1994 industry.

Users and analysts said the extent to which the decree has been thwarting ISSC's business is difficult to gauge. Gerstner has directed ISSC to increase its emphasis on profitability. In 1993, the subsidiary earned about $150 million on $4 billion in revenue for a slim profit margin of about 4%.

For one ISSC customer, Amtrak in Washington, the decree meant ISSC paid Amtrak less than it might have to buy back IBM hardware. The decree bars ISSC from borrowing from IBM Credit Corp., according to Dave Hardrick, Amtrak's senior director of data processing and telecommunications.

ISSC paid $10 million for the equipment but could have paid more if it had received IBM Credit Corp.'s favorable interest rates, Hardrick said.

Paper trail

- **1956:** Consent Decree mandates that IBM provide services only through a separate subsidiary that does not carry the IBM name or receive IBM price breaks. IBM forms Service Bureau Corp.
- **1968:** Control Data sues IBM in a private antitrust action with Consent Decree overtones.
- **1973:** IBM sells Service Bureau to Control Data, settling the Control Data suit.
- **1982:** IBM reenters the services business with the formation of its IBM Information Network.
- **1989:** IBM marks a major services watershed by winning the outsourcing job at Eastman Kodak Co., the largest commercial outsourcing pact of its time. It does so with internal resources, not through a separate subsidiary.
- **December 1990:** Dallas-based outsourcer Affiliated Computer Services files a complaint with the U.S. Department of Justice and in the ensuing months encourages other third parties to do the same. The claim: IBM's outsourcing business gives it an unfair advantage and violates the Consent Decree.
- **May 1991:** IBM establishes Integrated Systems Solutions Corp. outsourcing subsidiary.
- **June 1994:** IBM starts proceedings in U.S. District Court to terminate the decree.

—Mark Halper

Some analysts, such as International Data Corp.'s Paul Johnston, think Gerstner may be preparing to bring ISSC back in-house, in line with his intention to reverse predecessor John Akers' divisional spin-out strategies.

Dennie Welsh, ISSC chairman and IBM vice president, said last week there are no plans to pull ISSC back into IBM, but depending on market conditions, "that could change five years from now."

Roy Carlson, vice president of management services at ISSC customer Southern Pacific Lines in San Francisco, said he would view a move back in-house "with grave concern." Such a move, he said, would threaten ISSC's product objectivity and wed it more closely to IBM products.

The Justice Department has been unable to determine during a three-year investigation whether IBM has changed enough to abolish the decree — or whether ISSC has been violating it.

Those not in favor

Many outsourcing vendors oppose repeal of the decree.

IBM "would have an extreme advantage over others if they give themselves hardware and software," said Charles Young, president of Affiliated Computer Services, Inc. in Dallas. For more than three years, Affiliated Computer has been calling on the Justice Department to investigate IBM's alleged violations of the decree. Affiliated Computer and others believe that IBM's formation of ISSC in May 1991 did little to conform to the Consent Decree because ISSC continued on jobs won by IBM. The outsourcing arm also uses IBM's sales and marketing staffs.

"They gave birth to a $4 billion services business overnight, and that's just not real," said Lawrence Gross, general counsel at SunGard Data Systems, Inc. in Wayne, Pa.

ISSC's largest competitors, Electronic Data Systems Corp. and Computer Sciences Corp., declined to comment. Both have long kept a low profile on the issue, although when vying for a Continental Airlines deal in 1991, EDS stated in Continental bankruptcy proceedings that IBM's outsourcing proposal was in violation of the decree.

Mid-Atlantic senior correspondent Thomas Hoffman contributed to this article.

Wysiwyg

Illustrations by Wayne Vincent

If you were on a desert island, what books would you want with you?

- **The Sears catalog, for toilet paper.**
- **The complete works of Shakespeare, which should keep me busy for a while.**
- **A book of dirty jokes to keep me in good humor.**

—Valerie Morganfield, administrative assistant, information technology services, Packaging Corporate of America, Evanston, Ill.

- **A Boy Scout field manual**
- ***War and Peace*: By the time I'll get to the end of it, I'll forget how it started.**

—Larry Townley, staff sergeant, U.S. Marine Corps., Yuma, Ariz.

- ***The Complete Angler***
- ***365 Ways to Prepare Fish***
- **The wedding album from my first marriage to remind me that things could be worse.**

—Bill Davis, librarian, Emory University Hospital Library, Atlanta

- ***Handbook of Practical Boatbuilding***
- ***Wilderness Survival Guide***

—Leonard Zettel, senior research engineer, Ford Motor Co., Detroit

Wysiwyg compiled by Tim Ouellette and Lory Dix
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Inside Lines

Licensed to charge

Oracle has plans under way to simplify pricing for its networked software. In the next few weeks, the database heavy-hitter is expected to announce Network User Licensing, a program the vendor has been testing for the past six months. It is designed to simplify pricing and provide its database customers with choices of per-user or concurrent licensing on a networkwide basis. The new model is expected to help users rationalize software costs and extend per-user and concurrent software licensing beyond its current server-based scheme, according to Karen Cone, research director of Gartner Group's Software Asset Management service.

Client/server can wait

Software 2000 has postponed its introduction of a client/server version of its AS/400 human resources software from this month to the fall. The Software 2000 product, which is being written in object-oriented code, is expected to be one of the first true AS/400 client/server applications to hit the market. The delay stems from IBM's de-emphasis of its Envy/400 development environment. IBM is also apparently still mulling over how it will package the suites of objects that make up the product.

The envelopes, if you please . . .

As part of the recent reorganization of IBM's Workplace OS engineering teams [CW, May 30], the company gave its AS/400 lab in Rochester, Minn., responsibility for developing a future enterprise server platform that would run Taligent's operating system, industry sources said. A low-end PC server will be developed by the Personal Systems unit in Boca Raton, Fla., they added. The machines and the Taligent operating system loom large in IBM's future strategy but are not expected to materialize until the end of the decade.

The emperor has no NetWare

Sybase has been nosing around Novell looking for a bundling deal that would combine Sybase's SQL Server database with NetWare, according to industry observers. Sybase needs to find a way to address the lower-end, Intel-based user set now that it and Microsoft have gone their separate ways on SQL Server, one analyst said. The vendor supports NetWare, but on a version of its database that is already two versions old. But Sybase has promised to put its latest System 10 database on the Novell operating system sometime this year. "Sybase happily used to let Microsoft service that mainly PC market while it went after bigger systems," the analyst said. "Now they're seeing that they're naked."

Not so fast

Hewlett-Packard may be bucking all the computer industry odds these days with its consistently healthy financial performance. But in at least one way it is blending into the pack: the delay of a major software release. The introduction of Version 5.0 of its MPE/IX operating system is running more than a month behind schedule and has been pushed back to the week of June 20. A spokesman said the problems are logistical, not technical, noting that the company needs to fully prepare its sales force.

The Cyberspace community is banding together to help one of its own. ZiffNet, an on-line information service about personal computing, last week announced the availability of The ZiffNet Cookbook: Recipes from the Digital Diner. The cookbook was created to raise money for the family of David Alsberg, a ZiffNet member killed in December by a stray bullet during a New York City robbery. ZiffNet and CompuServe members can access the cookbook's 140 recipes in the Windows Help format and ASCII by typing GO COOKBOOK. The cookbook is offered as shareware, with a $5 registration fee. And to whet your news appetite, consider getting in touch with Computerworld *about news items or tips. You can call our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News Editor Maryfran Johnson can be reached by phone at (508) 820-8179, via the Internet at mjohnson@cw.com or through MCI Mail at 590-8017.*

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- ☐ ☐ Packet Switches
- ☐ ☐ Data Switches
- ☐ ☐ PBX
- ☐ ☐ Voice Mail
- ☐ ☐ **Mainframe/Minis**
- ☐ ☐ **Other** _____

Operating Systems

[A] [B]

- ☐ ☐ MS DOS
- ☐ ☐ Macintosh
- ☐ ☐ OS/2
- ☐ ☐ UNIX
- ☐ ☐ Windows
- ☐ ☐ AIX
- ☐ ☐ HPUX
- ☐ ☐ OSF/1
- ☐ ☐ **Network OS**
- ☐ ☐ Netware
- ☐ ☐ Appletalk
- ☐ ☐ Vines
- ☐ ☐ Pathworks
- ☐ ☐ IBM PC LAN
- ☐ ☐ LAN Server
- ☐ ☐ LAN Manager
- ☐ ☐ UNIX
- ☐ ☐ Peer-to-Peer
- ☐ ☐ High-Speed Modems
- ☐ ☐ **Other** _____

Peripherals

[A] [B] (please specify platform first)

- ☐ ☐ **PCs**
- ☐ ☐ **Workstations**
- ☐ ☐ **Mainframe/Minis**
- ☐ ☐ Monitors
- ☐ ☐ X Terminal
- ☐ ☐ Hard Disk Drive
- ☐ ☐ Cartridges
- ☐ ☐ Tape Back-up
- ☐ ☐ PCMCIA Cards
- ☐ ☐ UPS
- ☐ ☐ CD ROM
- ☐ ☐ Optical Drive
- ☐ ☐ Line Printer
- ☐ ☐ Dot Matrix Printer
- ☐ ☐ Laser Printer
- ☐ ☐ Inkjet Printer
- ☐ ☐ Color Printer
- ☐ ☐ Scanners
- ☐ ☐ **Other** _____

Software

[A] [B] (please specify platform first)

- ☐ ☐ **PCs**
- ☐ ☐ **Workstations**
- ☐ ☐ **Mainframe/Minis**
- ☐ ☐ All Software
- ☐ ☐ Application Software
- ☐ ☐ Spreadsheets
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- ☐ ☐ Systems Management
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